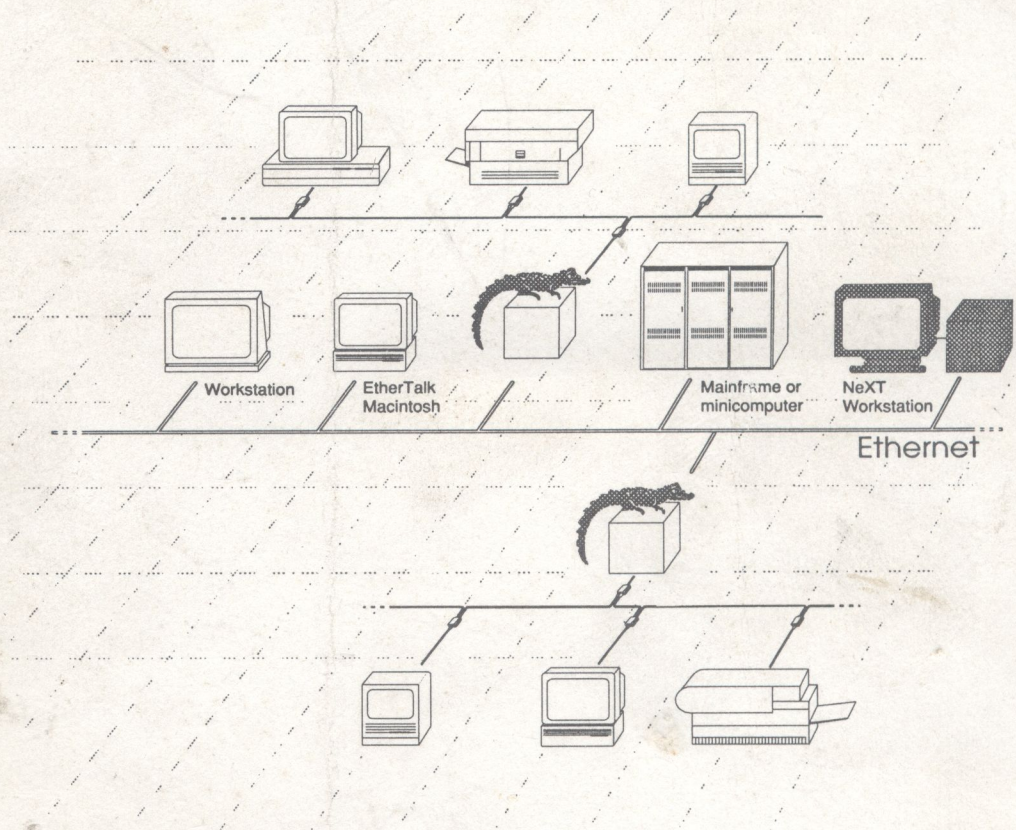


GatorAid™

GatorBox Troubleshooting Guide

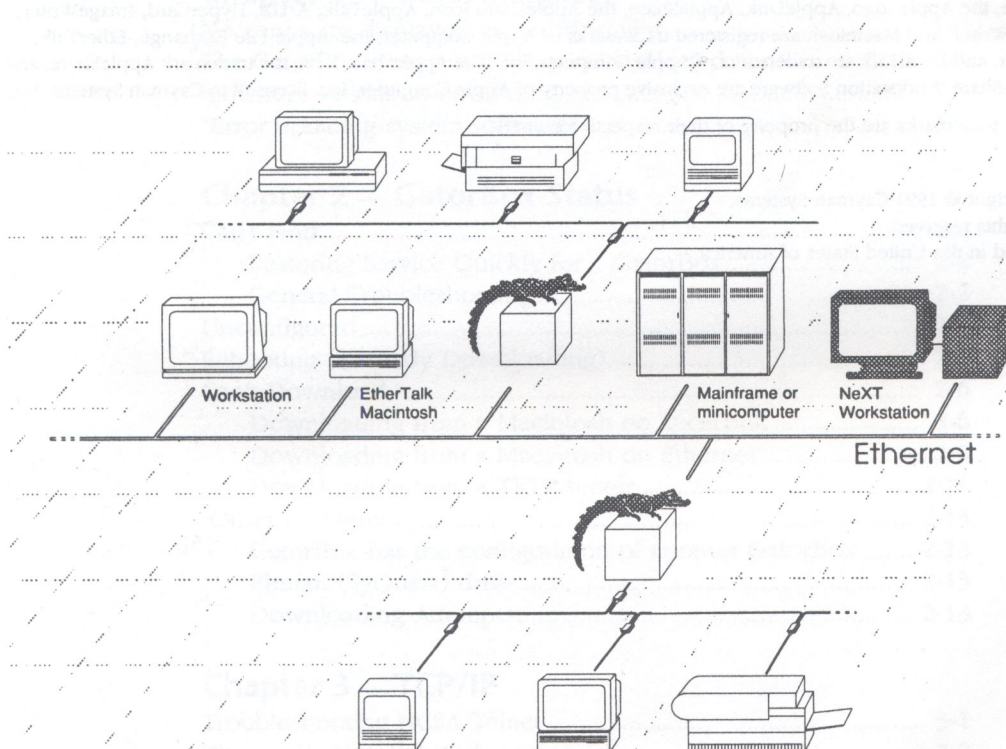
Release 2.0
August 1991



GatorAidTM

GatorBox Troubleshooting Guide

Release 2.0
August 1991



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Appendix I — Glossary

Index

Introduction

Objective

Troubleshooting tools

Manual conventions

How to use this guide

How to get more help

Before you call

Objective

The purpose of this guide is to provide you with assistance in troubleshooting common problems associated with GatorBox hardware, GatorBox software products, and related 3rd party products. These guidelines follow the same steps that Cayman technical support engineers use to diagnose and solve problems.

Troubleshooting tools

If you are unfamiliar with network troubleshooting, you may want to familiarize yourself with Appendix A, "GatorBox Troubleshooting Tools."

Manual conventions

Throughout this manual the following conventions apply:

- ▶ **File->Print** indicates a pull-down menu choice. For example, **File->Print** means to select **File** from the menu bar at the top of the screen, then choose the **Print** option.
- ▶ **more /etc/hosts** indicates a command or command output.
- ▶ **ping <GatorBox name>** indicates that the text between the less than and greater than signs (<GatorBox name>) describes a variable that will differ from site to site.
- ▶ **etherfind [-tx]** indicates that command options between the brackets ([-tx]) are optional.
- ▶ An **exclamation point** icon indicates **Alert** information. Alert messages provide warning or similar information about an activity or concept.



- ▶ A **talking head** icon indicates **Note** information. Notes provide supplementary information about an activity, concept or suggestions for how to find more information.

How to use this guide

To use this guide:

1. Look up the problem you are having in the table of contents.
2. Turn to the relevant chapter and follow the troubleshooting instructions for that problem.
3. Using the table of contents, index, and appendices, identify additional relevant information. For example, look up Digital Equipment Corporation (DEC) or Ultrix in the table of contents and index to identify problems associated with a Digital Equipment system running Ultrix.

Example 1

When you use NCSA Telnet, the application launches but you are unable to connect to the host.

- ▶ Look up the error condition in the table of contents. This directs you to the “TCP/IP” chapter.
- ▶ Open the TCP/IP chapter to the “Symptoms and solutions” section dealing with that error condition.
- ▶ Follow the troubleshooting instructions for “All Applications.”
- ▶ Follow the instructions specified under the subsection “MacTCP Applications” or “Non-MacTCP Applications,” whichever is relevant to your environment.
- ▶ Peruse the table of contents and index to identify associated subject areas.

Example 2

When you try to mount a GatorShare volume, you get the error message *Unknown user or log on is disabled*.

- ▶ Look up the error message in the table of contents. This directs you to the “Troubleshooting GatorShare” chapter.
- ▶ Turn to the GatorShare chapter and follow the instructions to obtain GatorBox diagnostics.
- ▶ Look up the diagnostics error message and follow the troubleshooting instructions.
- ▶ Peruse the table of contents and index to identify other subject areas that pertain to your problem.

How to get more help

If you are unable to solve your problem, please contact Cayman Technical Support:

Telephone:	617-494-1999
Fax:	617-494-5167
internet:	support@cayman.com
AppleLink:	CAYMAN.TECH

Before you call

Before you call, please have the following information available. In order to solve your problem more quickly, we may ask you to send the following information to us.

- ▶ A printout of your GatorBox configuration. To print your configuration, start GatorKeeper and click on the GatorBox icon so that it is highlighted. Then choose **File->Print**.
- ▶ A printout of your GatorBox diagnostics while the problem is occurring. This may not always be available. To print your diagnostics, start

GatorKeeper and choose ***Special->Diagnostics***. Wait for 10-15 seconds or until new messages stop scrolling then choose ***File->Print***.

- ▶ A diagram of your network
- ▶ All appropriate version numbers including:
 - ▷ GatorBox hardware version and serial number. Choose ***Special->Info*** in GatorKeeper to obtain this information.
 - ▷ GatorBox software
 - ▷ NFS server operating system and machine type
 - ▷ Other software or hardware you may be encountering problems with in conjunction with the GatorBox, such as atalkad or TOPS.

Chapter 1

GatorInstaller

No zones are displayed in GatorInstaller

The GatorBox does not display in its selected zone

“Software validation error”

“Error updating system software”



This section applies to the GatorBoxCS only. It does not apply to the original GatorBox.

GatorInstaller is the program that you run to download new or optional software into the GatorBox CS. Common problem indicators are:

- ▶ No zones are displayed in the GatorInstaller window.
- ▶ The GatorBox is not displayed when its zone is selected in the GatorInstaller window.
- ▶ You get the error, "Software validation error" when you start GatorInstaller.
- ▶ You get the error, "Error updating system software," while GatorInstaller is running.

No zones are displayed in GatorInstaller

If no zones are displayed in GatorInstaller, then it is likely that no zones are displayed in the Chooser as well.

1. The GatorBox is not turned on.
 - ▷ Check to see if the GatorBox is on. The green light should be solid and the yellow lights should be flashing.
2. There is only one zone name in the AppleTalk network. If this is the case, then the Chooser does not display the single zone name.
3. There is a bad network connection between the Macintosh and the GatorBox.
 - ▷ Verify that the LocalTalk and/or Ethernet cables are connected to the appropriate ports of the GatorBox and the Macintosh.
 - ▷ If you have Telnet installed on your Macintosh, see if you can Telnet to the GatorBox. If you cannot, then you may have a broken connection. Try switching cables.

The GatorBox does not display in its selected zone

- ▷ Look on the LocalTalk net using CheckNET or Inter•Poll to identify a type “GatorBox”.
- ▷ If you running GatorInstaller from a remote zone, check the switch on the back of the GatorBox to make sure it is set to the type of ethernet you are using.



If you are using Macintosh System 7, make sure you are using GatorSystemCS, GatorPrintCS, or GatorShareCS version 1.6.1X3 or later. The GatorBox CS may not display for CheckNET or Inter•Poll in previous versions due to a change in System 7.

The GatorBox does not display in its selected zone

When you select a zone in the GatorInstaller window, the GatorBox does not display in the “GatorBoxes to be updated” portion of the dialog box.

1. The GatorBox is not turned on.
 - ▷ Check to see if the GatorBox is on. The green light should be solid and the yellow lights should be flashing.
2. There/ is a bad network connection between the Macintosh and the GatorBox.
 - ▷ Verify that the LocalTalk and/or Ethernet cables are connected to the appropriate ports of the GatorBox and the Macintosh.
 - ▷ If you have Telnet installed on your Macintosh, see if you can Telnet to the GatorBox. If you cannot, then you may have a broken connection. Try switching cables.
 - ▷ If you are running GatorInstaller from a remote zone, check the switch on the back of the GatorBox to make sure it is set to the type of ethernet you are using.

3. The GatorBox is not routing AppleTalk because GatorInstaller was previously interrupted during an update. If the installer begins but does not complete successfully, the GatorBox is left in a partially updated state. It cannot route in this state, so it must be reinstalled from the LocalTalk side of the GatorBox.
 - ▷ Run GatorInstaller from a Macintosh directly connected to the GatorBoxes LocalTalk.

"Software validation error"

This error may occur following your file selection in the GatorInstaller file window.

1. You chose the wrong file.
 - ▷ Select the GatorBox and choose the correct file.
2. The file you selected is corrupted.
 - ▷ Move the file to the trash can and empty the trash. Then recopy the file from the disk and try again.

"Error updating system software"

This error may occur after the update has begun operation.

1. The installation may have encountered intermittent difficulty, for example, another router in the path may have gone down.
 - ▷ Quit GatorInstaller and try again.



Remember - if GatorInstaller is interrupted you will have to do subsequent installs from a Macintosh on the same LocalTalk as the GatorBox.

2. If a retry doesn't work, call Cayman Technical Support.

Chapter 2

GatorBox Status

Can't Find

Unconfigured

Rebooting

Can't Download

Other problems

The status of the GatorBox may indicate the type of restart problem the GatorBox is having. To determine the status of the GatorBox, start GatorKeeper, click on the **GatorBox<name>** icon and choose **Special->Status** from the menu bar at the top of the screen.

- ▶ **Can't Find** indicates that GatorKeeper running on the Macintosh can't communicate with the GatorBox
- ▶ **Unconfigured** indicates that the GatorBox has never been configured or that its configuration settings have been cleared.
- ▶ **Rebooting** for the GatorBox indicates that it is in the process of receiving its configuration information from a download server or, for a GatorBoxCS, that it is in the process of reinitializing.
- ▶ **Can't Download** indicates that the GatorBox could not download its files. This is not applicable to GatorBoxCS.
- ▶ **Running** indicates that the GatorBox is functioning.
- ▶ If the GatorBox<name> icon does not display in GatorKeeper, it indicates that the Macintosh can't communicate with the GatorBox. Follow the instructions for the "Can't Find" status.

Can't Find

The **Can't Find** status indicates that GatorKeeper running on the Macintosh can't communicate with the GatorBox. You can follow these same instructions if the **GatorBox<name>** icon does not appear in the GatorKeeper window.

Restoring Service Quickly for a GatorBox

If you are using a GatorBox and not a GatorBoxCS, the **Can't Find** status may also indicate that the GatorBox is not running because it has failed to download. While a detailed troubleshooting procedure follows this section, the following steps provide the quickest way of attempting to restore services to your users.

1. Isolate your GatorBox and the Macintosh on their own LocalTalk at the original location of the GatorBox. The GatorBox Ethernet cable should also be disconnected.

It's important to conduct this test where the GatorBox will remain plugged in. This way you don't have to turn the power off the GatorBox should you succeed in getting it up and running.

2. Run GatorKeeper and see if the new setup resolves the problem.
3. If the problem is not resolved, you must continue with the more detailed steps outlined in "General Troubleshooting" below.
4. If the problem is resolved, you have narrowed the problem down to some part of the network that lies between the GatorBox and the Macintoshes original local, for example, a break in the cable. Reattach the full LocalTalk and Ethernet connections to the GatorBox to restore service to your users while you continue to isolate the problem.

General Troubleshooting

1. The GatorBox is rebooting. The **Can't Find** status may occur for a few seconds at the beginning and end of the reboot process. During these time periods, the GatorBox is unable to respond to GatorKeeper.
 - ▷ Wait to see if the **Can't Find** status persists longer than 30 seconds.

2. The GatorBox may have crashed and need to be manually restarted.
 - ▷ Power the GatorBox down for 10 seconds and restart it.
3. AppleTalk has not been selected in the Chooser.
 - ▷ Pull down the Apple menu and select the Chooser option. Make sure the AppleTalk Active radio button has been selected.
4. The appropriate port has not been selected in the Network Control Panel.
 - a. Pull down the Apple menu and select the **Control Panel** option.
 - b. Scroll until you see the **Network** icon on the left hand side of the window, then click on the Network icon.
 - c. If you are running GatorKeeper from a Macintosh on LocalTalk, make sure that the **Built-in** icon is highlighted within the Network window.
 - d. If you are running GatorKeeper from a Macintosh on Ethernet, make sure that the **EtherTalk** icon is selected.
5. The cabling may be incorrect.
 - a. If you are running GatorKeeper from a Macintosh on LocalTalk:
 - Make sure that you are using suitable AppleTalk cabling. This means that each cable coming out of the GatorBox and the Macintosh should have a box on it, and the two cables with boxes should be connected using a third cable. If you are using PhoneNET, verify that you are connected via telephone to a wall jack.
 - Check that one end of the AppleTalk cable is securely inserted into the Printer port of the Mac, not the modem port. The Printer port is indicated by a picture that looks like a printer with a piece of paper coming out of it.

- Check that the other end of the AppleTalk cable is securely inserted into the top port of the GatorBox, labeled "LocalTalk", *not* the port labeled "Serial."
 - Make sure your AppleTalk network is terminated properly. This is especially important if you are using PhoneNet. Refer to the documentation for your type of cable for more information on proper network termination.
- b. If you are running GatorKeeper from a Macintosh on Ethernet, the incorrect type of Ethernet may be selected on the GatorBox:
- If you are using a GatorBoxCS, verify the Ethernet switch setting on the back of the GatorBox.
 - Make sure that your transceiver or T-connector is properly installed.
6. The AppleTalk cabling may be defective.
- a. Replace the cable coming out of the Macintosh and the one coming out of the GatorBox.
 - b. Isolate the GatorBox and the Macintosh. This means that the ethernet port on the GatorBox should be disconnected, and that the Macintosh and GatorBox should only be connected to each other.
 - c. If you are using a Star Controller or other type of repeater between the GatorBox and the Mac, change the port into which the Macintosh and/or GatorBox is inserted.
7. If AppleTalk Routing was just turned on in the GatorBox, the Macintosh may need to be rebooted. This is due to the fact that the Macintosh was previously using short DDP headers, and the Appletalk network is now using long DDP headers.
- ▷ Reboot the Macintosh.
8. There may be an init conflict.
- ▷ Reboot the Macintosh from the system startup diskette and restart GatorKeeper.

9. The Macintosh may be defective. This may be indicated if the Mac also seems to be crashing frequently.

▷ Transfer all the Gator software to a different Macintosh and try downloading from there.

10. The GatorBox may be defective. Call Cayman Technical Support.



A hardware deficiency may exist in GatorBoxes that were manufactured during April of 1990 that causes the LocalTalk port of the GatorBox to shut down. If you are using a GatorBox and not a GatorBoxCS, check the serial number on the back of the GatorBox. If the last four digits are 1590, 1690, 1790, 1890 or 1990, for example, GB02019-1690, contact Cayman Technical Support.

Unconfigured

1. The GatorBox has never been configured. This does not apply to the GatorBoxCS which is originally provided with a minimal configuration.

▷ Double click on the **GatorBox<name>** icon, and configure the GatorBox with your network specifications. Refer to the User Guide for the software you are running for instructions. Then choose **Special->Reload software** to download the software and the new configuration information.

2. The NVRAM has been cleared. You can clear the NVRAM of the GatorBox and the GatorBoxCS by selecting the **GatorBox<name>** icon and choosing **Edit->Clear**.

▷ Reconfigure and then choose **Special->Reload software**.

3. The configuration information may have been added to the **GatorDefaults** icon instead of the **GatorBox<name>** icon.

a. Double click on the **GatorDefaults** icon, then double click on the configuration options to determine whether the information contained in the menus is specific to your network.

b. If the information in **GatorDefaults** is correct, close the configuration menu then drag the **GatorDefaults** icon over the

GatorBox<name> icon. A dialog box appears. Click on the **Replace Configuration** button.

- c. Click on the **GatorBox<name>** icon and choose **Special->Reload software**.

Rebooting (formerly Downloading)

This status represents normal operation when the GatorBox or GatorBoxCS is in the process of restarting, either because of a power failure or a manual restart.

The GatorBox may remain in this status for up to 2 1/2 minutes while it downloads executable and configuration files. The GatorBoxCS may remain in this status for approximately 45 seconds while it reinitializes its services.

Can't Download

This section is applicable only to the original GatorBox and not to the GatorBoxCS. The GatorBoxCS does not need to download files when it is powered up.

The original GatorBox needs to download three files in order to reach the running state: the image file (GatorSystem, GatorPrint or GatorShare), GatorDatabase, and GatorBox<name>. If it fails to download these files, then it will display the **Can't Download** status. Choose **Special->Diagnostics** to determine which portion of the download failed.

Downloading from a Macintosh on LocalTalk

This section applies if you are downloading from a Macintosh on LocalTalk.

1. The Macintosh is not registered on the net as a GatorBox download server.
 - a. To be a download server, either GatorKeeper must be running or the Macintosh must have been rebooted with the GatorBoxTFTP init in the system folder.

- b. If you have Interpoll or CheckNET, you can verify that the GatorBox is registering itself correctly by looking for a device of type TFTPServer in the GatorBox's LocalTalk zone.
2. The file the GatorBox is looking for is not in the required location.
 - a. If you are using the GatorBoxTFTP init, then the image file (GatorSystem, GatorPrint or GatorShare), GatorDatabase, GatorDefaults and GatorBox<name> must be in the System Folder.
 - b. If GatorKeeper is running, the files must be in either the System Folder or the same folder as GatorKeeper.
3. There is an init conflict. Reference Chapter 9, "Third Party Software," for more information about init conflicts.
 - ▷ Restart the Macintosh from the startup diskette and try to download again.
4. The GatorBox is downloading using a file or server other than the one you think it is.
 - a. Verify that the primary and secondary download servers specified in the **Download Servers** configuration are the same ones you want to use.
 - b. Verify that the file name specified in the **Download Servers** configuration is the same as the file you have on your download server.
 - c. If the server name specified in **Download Servers** is an equal sign (=), there may be another Macintosh running GatorKeeper or using with the GatorBoxTFTP in the system folder.
 - Use CheckNET or Interpoll, search the LocalTalk zone configured in the GatorBox for a type "TFTPServer".
 - If you do not have CheckNET or Interpoll, check other Macintoshes on the LocalTalk to make sure that they do not have the GatorBoxTFTP init in the system folder or GatorKeeper running, or isolate GatorBox and the Macintosh you want to be the download server.

5. The file(s) may be corrupt. The GatorBox diagnostics may indicate the file it has failed to download.
 - a. If the suspect file is GatorDatabase, quit GatorKeeper, move the file to the trashcan and empty the trash. Then restart GatorKeeper and click **Create Database** when the appropriate dialog box appears.
 - b. If the suspect file is GatorSystem (or GatorPrint or GatorShare, as appropriate), then move the file to the trashcan, empty the trash, then re-install the file from the GatorBox software diskette.
 - c. If the suspect file is GatorBox<name>, then you will have to clear NVRAM and reconfigure the GatorBox.
 - Save the current configuration settings. To do this, start GatorKeeper, select the GatorBox<name> file and choose **File->Print** to get a hard copy. Then drag the GatorBox<name> icon over the GatorDefaults icon and replace the configuration settings. Last, select GatorDefaults and choose **File->Save**.
 - Select the GatorBox<name> icon, then choose **Edit->Clear**. This clears the NVRAM.
 - Within 20-25 seconds, a new icon should display that flashes with the message, "Double click here". If the new icon does not display, quit and restart GatorKeeper, or power off the GatorBox for 10 seconds then restart it. If the new icon still does not display, follow the instructions applicable to the "Can't Find" status detailed earlier in this chapter.
 - Reconfigure the GatorBox. If the configuration is stored in the GatorDefaults icon, drag the GatorDefaults icon over the GatorBox<name> icon and click **Replace Configuration**. If you must manually reconfigure, double click on the GatorBox<name> icon and complete the configuration menus.
 - Restart the GatorBox to download the new configuration.



It is difficult to determine whether the corruption is in how the file is stored on disk, or the settings themselves. Sometimes the configuration settings themselves contain illegal characters that make the file unreadable. In this case, it is best to reconfigure manually instead of using the copy stored in GatorDefaults.

6. The GatorKeeper application file may be corrupt.
 - a. Move GatorKeeper to the trashcan.
 - b. Empty the trash.
 - c. Re-install GatorKeeper from the GatorBox software diskette.

Downloading from a Macintosh on Ethernet

This section applies if you are downloading from a Macintosh on Ethernet.

1. The Macintosh is not set up to be a download server.
 - a. Make sure that the UDP/TFTP init file is in the System Folder, then reboot the Macintosh to make sure the init is loaded.
 - b. Check the Control Panel to make sure that MacTCP is set with a manually assigned IP address that matches the one defined in the Download Servers menu in GatorKeeper.
 - c. Check the Network Control Panel to make sure that the Ethernet icon selected.
 - d. The required files - GatorDatabase, GatorBox<name> and the image file (GatorSystem, GatorPrint or GatorShare) must be in the System Folder.
2. There is an init conflict. For more information on init conflicts, see Chapter 9, "Third Party Software."
 - ▷ Restart the Macintosh from the startup diskette and try to download again.
3. There is a problem with the network connection.
 - a. Verify that all IP routers and network connections in between the GatorBox and the Macintosh
 - b. Swap the Ethernet connector on the Macintosh and/or the GatorBox for a different one.

4. The GatorBox is downloading using a file or server other than the one you think it is downloading from.
 - a. Verify that the primary and secondary download servers specified in the Download Servers configuration are the same ones you want to use.
 - b. Verify that the file name specified in the Download Servers configuration is the same as the file you have on your download server.
5. The file may be corrupt.
 - a. If the suspect file is GatorDatabase, quit GatorKeeper, move the file to the trashcan and empty the trash. Then restart GatorKeeper and click Create Database when the appropriate dialog box appears.
 - b. If the suspect file is GatorSystem (or GatorPrint or GatorShare, as appropriate), then move the file to the trashcan, empty the trash, then re-install the file from the GatorBox software diskette.
 - c. If the suspect file is GatorBox<name>, then you will have to clear NVRAM and reconfigure the GatorBox.
 - Save the current configuration settings. In GatorKeeper, select the GatorBox<name> file and choose **File->Print** to get a hard copy. Then, if the settings are not already copied to the GatorDefaults file, drag the GatorBox<name> icon over the GatorDefaults icon and replace the configuration settings. Then select GatorDefaults and choose **File->Save**.
 - Select the GatorBox<name> icon, then choose **Edit->Clear**. This clears the NVRAM.
 - Within 20-25 seconds, a new icon should display that flashes with the message, "Double click here". If the new icon does not display, quit and restart GatorKeeper, and power off the GatorBox for 10 seconds then restart it. If the new icon still does not display, follow the instructions applicable to the "Can't Find" status detailed earlier in this chapter.

- Reconfigure the GatorBox. If the configuration is stored in the GatorDefaults icon, drag the GatorDefaults icon over the GatorBox<name> icon and click "Replace Configuration". If you must manually reconfigure, double click on the GatorBox<name> icon and complete the configuration menus.
- Restart the GatorBox to download the new configuration.



It is difficult to determine whether the corruption is in how the file is stored on disk, or the settings themselves. Sometimes the configuration settings themselves contain illegal characters that make the file unreadable. In this case, it is best to reconfigure manually instead of copying the original settings to, and then from, GatorDefaults.

6. The GatorKeeper application file may be corrupt.
 - a. Move GatorKeeper to the trashcan.
 - b. Empty the trash.
 - c. Re-install GatorKeeper from the GatorBox software diskette.

Downloading from a TFTP server

This section applies if you are downloading from a server running the tftp daemon.

1. You may have transferred the files incorrectly from the Macintosh to the tftp server.
 - ▷ Re-ftp the files from the Mac to the TFTP download server. Make sure binary transfer mode is on (type "bin" at the ftp prompt) and that MacBinary is disabled under the File menu.
2. The file it is looking for is not in the required location.
 - a. The files must be in the directory specified in the **Download Servers** menu in GatorKeeper.
 - b. If you are using secure tftp, the download directory must be the secure directory specified by your tftp host, for example /tftpboot. In addition, the **Path to data files** field in GatorKeeper does not specify /tftpboot, but only the subdirectory. For example, if the

files are in /tftpboot/GatorBox, the **Path to data files** is specified as "GatorBox/" If the files are in /tftpboot, the **Path to data files** is specified as "/".

- c. The parent directory and the files must have a minimum of world readable and executable permissions.
 - d. All other directories in the path must have a minimum of world executable permission.
3. Download server could not be reached.
- a. The tftp daemon is not running.
 - Type `ps -aux` (or `ps -ef`) on the tftp server and look for the `tftpd` or `inetd` process.
 - If the `tftpd` process is not running but the `inetd` process is, then look in the `/etc/inetd.conf` file for a line that lists the command that starts the tftp daemon, for example, `"/usr/etc/tftpd -s /tftpboot."` If this line does not appear, or is commented out (i.e., begins with a `#` sign), then tftp daemon is not running.
 - b. There is a network timeout.
 - Verify that all IP routers and network connections in between the GatorBox and the download server.
 - Swap the Ethernet connector on the download server and/or the GatorBox for a different one.
4. The GatorBox is downloading using a file or server other than the one you think it is downloading from.
- a. Verify that the primary and secondary download servers specified in the **Download Servers** configuration are the same ones you want to use.
 - b. Verify that the file name specified in the **Download Servers** configuration is the same as the file you have on your download server.

Other problems

GatorBox has the configuration of another GatorBox

This may occur if you have installed two GatorBoxes on separate LocalTalk wires, and then connected the two LocalTalk wires together. When you do this, the two GatorBoxes may acquire the same node number. After connecting the two wires, configuration information bound for one GatorBox might end up on another.

To resolve this, make sure the networks are connected then restart one of the GatorBoxes. It will acquire a new and unique node number.

Ehman (SyQuest) drive

When an Ehman (SyQuest) drive is in the SCSI chain, the downloading the GatorBox may fail with the diagnostics error, "BS - Open File Error". Remove the drive from the SCSI chain (no software inits are removed) and re-download the GatorBox. This is not applicable to the GatorBoxCS.

Downloading Attempts

The GatorBox will make 6 attempts at downloading from the primary download server over the course of about a minute, then it try the secondary download server for another 30 seconds. If you enable "retry forever" for the tftp server option, the GatorBox will attempt to download from that server for approximately 9 hours before it gives up.

Chapter 3

TCP/IP

Troubleshooting NCSA Telnet

The application fails to launch

The application launches but you can't connect

Other problems

TCP/IP problems usually don't show up until you try to run a Macintosh application on your Macintosh that uses TCP/IP functionality, such as NCSA Telnet. There are two major types of problems that you may encounter when you try to run your application.

- ▶ The application fails to launch, and either returns to the Finder with no error message or with the error "Can't assign dynamic/static IP address."
- ▶ Once the application launches, you are unable to connect from your Macintosh to the host. You may see an error, "Local host or gateway not responding," "Couldn't connect to Host," or nothing happens.

Each section is subdivided into the following categories:

- ▶ **All Applications** — These steps apply to all applications exhibiting this symptom.
- ▶ **MacTCP Applications** — These steps apply to applications using MacTCP. Frequently the name of the application indicates if it uses MacTCP, for example, *NCSA Telnet 2.3 - MacTCP*-. Other applications that use MacTCP are GatorMail-Q, HyperFTP, or MacX.
- ▶ **Non-MacTCP Applications** — These steps apply to applications that are NOT using MacTCP. For example, *NCSA Telnet 2.3*.

The application NCSA Telnet and the configuration file `config.tel` are the example used in the steps outlined below. Other applications will refer to the same types of options.

Troubleshooting NCSA Telnet

NCSA Telnet is a TCP/IP-based public domain software that Cayman ships as a convenience to its customers. It is the primary example used in this troubleshooting section. Other TCP/IP-based applications may have similar problems or symptoms. To troubleshoot an NCSA Telnet problem:

- ▶ Locate your symptom and follow the steps provided.
- ▶ Refer to the "Other problems" section at the end of this chapter for additional information.

The application fails to launch

This symptom indicates that the Macintosh failed to get an IP address. The actual error you see is application specific but may appear in one of the following forms:

- ▶ Error message - "Unable to register dynamic (KIP) IP address"; or
- ▶ Error message - "Unable to register static IP address"; or
- ▶ The application quits immediately upon being launched.

All applications

The following steps apply to both MacTCP and non-MacTCP applications.

1. In the TCP/IP configuration menu of GatorKeeper, select **MacIP Options** and verify the following:
 - a. MacIP Options are turned on by choosing either **KIP forwarding** or **IP subnetting** in the MacIP options window.
 - b. A starting IP number has been specified that is different from the one assigned to the GatorBox itself and that is not already in use by another device on the network.
 - c. A correct number of static and dynamic addresses have been specified.
 - d. All IP addresses in the static and dynamic range are unique, that is, they are not already in use on your network.
2. If there is another GatorBox or other router (for example, a FastPath) that resides on a different LocalTalk network with the same zone name as the network on which your GatorBox resides, set the **Restrict NBP Lookups to LocalTalk** option under the **TCP/IP->MacIP Options->More** window.

MacTCP applications



If you have MacTCP installed, make sure you are using the MacTCP version of the application. You cannot use a non-MacTCP version of an application if you have MacTCP installed.



The MacTCP Control Panel contains three options under the "Obtain Address" heading: Manual, Server, and Dynamic. Manual in MacTCP corresponds to Static in the GatorBox and Server corresponds to Dynamic; Dynamic in the MacTCP Control Panel refers to Reverse Address Resolution Protocol (RARP); it has no corresponding option in the GatorBox.

Macintosh on LocalTalk

1. The LocalTalk icon should be selected in the MacTCP Control Panel.
2. If you have AppleTalk Routing turned on in the GatorBox, the LocalTalk zone under this icon should be the LocalTalk zone in which the GatorBox resides.
3. If you have selected **Manual** address assignment in the MacTCP Control Panel:
 - a. The manual address should *not* be within the GatorBox's dynamic address range and should be within the GatorBox's static range.
 - b. Verify that no other Macintosh is trying to use the same address. The way to do this is either to ask other users or use a program like CheckNET or Inter•Poll to see the address registered on the LocalTalk net.
 - c. If there is another AppleTalk router such as a Hayes InterBridge or a Shiva NetBridge between your Macintosh and the GatorBox, you must select **Server** address assignment and the LocalTalk zone in which the GatorBox resides. This is a general limitation of the MacIP protocol.
 - d. If the other router is itself offering MacIP service, that router must be set up for IP subnetting (i.e. *not* KIP forwarding).

For example, if a Macintosh is on the LocalTalk behind GatorBoxA (which has MacIP turned on), but you want your Macintosh to get

its IP number from GatorBoxB which is in a different zone, then GatorBoxA must be using IP subnetting. If GatorBoxA is set up for KIP forwarding, then you won't be able to get an IP number from GatorBoxB.

4. If you have selected **Server** style address assignment in the MacTCP Control Panel and there is another AppleTalk router between your Macintosh and the GatorBox, then make sure that the zone name under the LocalTalk icon is the same one in which your GatorBox resides.
5. If the GatorBox (i.e. the gateway being used by the MacTCP Macintoshes) has recently been rebooted, then all Macintoshes that use MacTCP must be re-booted. MacTCP remembers the node number of the gateway (i.e., the GatorBox). So if you reboot your gateway and it comes up with a different node number, MacTCP will keep trying to talk to the old node address.

Macintosh on Ethernet

1. If your Macintosh is directly connected to ethernet, you don't need to use the GatorBox. If you choose to bypass the GatorBox:
 - a. Choose the **Ethernet** icon in the MacTCP Control Panel.
 - b. Verify that the IP address specified in the MacTCP Control Panel is unique on the IP net and *not* in the GatorBox's assigned range.
2. If your Macintosh is directly connected to Ethernet and you *do* want to go through the GatorBox:
 - a. Choose the **EtherTalk** icon in the Network Control Panel
 - b. Choose the **EtherTalk** icon in the MacTCP Control Panel and make sure the zone is the same one in which the GatorBox resides.
 - c. If using manual address, make sure that the address specified IS within the GatorBox's range.
 - d. Make sure AppleTalk Routing is turned on in the GatorBox.

3. If the GatorBox (i.e. the gateway being used by the MacTCP Macintoshes) has recently been rebooted, then all Macintoshes that use MacTCP must be re-booted. MacTCP remembers the node number of the gateway (i.e., the GatorBox). So if you reboot your gateway and it comes up with a different node number, MacTCP will keep trying to talk to the old node address.

Non-MacTCP applications



If you do not have MacTCP installed, you must use the non-MacTCP version of the application.

If you are using a Macintosh running System 7, make sure you use GatorBox software (GatorSystem, GatorPrint or GatorShare) that is version 1.6.0X29 for the original GatorBox, or version 1.6.1X3 for the GatorBoxCS.

Macintosh on LocalTalk

1. In the config.tel file, make sure that you have the following entries:

hardware=AppleTalk

zone=<LocalTalk zone in which the GatorBox resides>

You can use a text editor such as Microsoft Word to make any necessary modifications to the file.

2. If you select a static IP address in the **Network->Configure Network** menu of NCSA Telnet, make sure of the following:
 - a. The static address should be within the GatorBox's static range and *not* be within the GatorBox's *dynamic* address range.
 - b. No other node on the network should be using the same address.
 - c. If there is another AppleTalk router, such as a Hayes InterBridge or a Shiva NetBridge, between your Macintosh and the GatorBox, you must use dynamic addressing. This is a general limitation of the MacIP protocol.
 - d. If the bridge is offering MacIP service, that bridge must be set up for IP subnetting (i.e. *not* KIP forwarding).

For example, is a Macintosh is on the LocalTalk behind GatorBoxA (which has MacIP turned on), but you want your Macintosh to get its IP number from GatorBoxB which is in a different zone, GatorBoxA must be using IP subnetting.

3. If you select dynamic address assignment in the **Network->Configure Network** menu of NCSA Telnet and there is another AppleTalk router between your Macintosh and the GatorBox, then the `zone=` field of `config.tel` must specify the LocalTalk zone in which the GatorBox resides.

Macintosh on Ethernet

1. If your Macintosh is directly connected to Ethernet, you do not need to use the GatorBox to use the application. If you choose to bypass the GatorBox:
 - a. Choose the **EtherTalk** icon in the Network Control Panel.
 - b. Choose **Network->Configure Network** from the NCSA Telnet menu bar and assign a static IP number that is *not* within the GatorBox's static or dynamic IP range.
 - c. Make sure that `config.tel` has an entry `hardware=ether`.
2. If your Macintosh is directly connected to Ethernet and you *do* want to go through the GatorBox:
 - a. Choose the **EtherTalk** icon in the Network Control Panel
 - b. Make sure that the `config.tel` file contains the lines
`hardware=AppleTalk` and `zone=<zone in which the GatorBox resides>`
 - c. Choose **Network->Configure Network** from the NCSA Telnet menu bar and choose dynamic IP address assignment. If you are on a Macintosh on Ethernet and choose to go through the GatorBox, you *must* use dynamic addressing.
 - d. Make sure AppleTalk Routing is turned on in the GatorBox.

The application launches but you can't connect

What you see as a result of this problem is application specific, but appears in one of the following forms:

- ▷ Error message - "Local host or gateway not responding"; or
- ▷ Error message - "Couldn't connect to host"; or
- ▷ A Telnet session appears to connect because a window opens, but it is blank; or
- ▷ There is no error message and you are returned to the Finder.

All applications

This section applies to both MacTCP and non-MacTCP applications.

1. There may be problems with the physical connection between the Macintosh, the GatorBox and the Ethernet network.
 - a. Try to Telnet to the GatorBox's IP address from a Macintosh on LocalTalk. If you can, go to step "b". If you cannot:
 - Make sure the LocalTalk connector is in the printer port in the back of the Macintosh.
 - Make sure the LocalTalk connector is in the LocalTalk port (the top one) of the GatorBox.
 - If you are using PhoneNET, try switching connectors. Also see Chapter 8, "Cabling."
 - b. Try to telnet from the host to which you are trying to connect to itself and then to the GatorBox. If you cannot:
 - On a server that is on the same IP net as the GatorBox, type the following command:

```
ping <GatorBox IP Address>
```

If you do not receive a response, go to the next bullet.

The application launches but you can't connect

- If you are using thick ethernet, swap the transceiver used by the GatorBox.
 - Check the integrity and termination of your Ethernet cable.
 - Check the GatorBox diagnostics for the message, "Ethernet Loopback failed." This is an internal loopback and may indicate a hardware problem. Call Cayman Technical Support.
- c. If your GatorBox is connected to a multiport repeater:
- Switch the GatorBox to an unused port on the repeater.
 - If you are using thick Ethernet and your GatorBox is connected to a multiport transceiver (such as a DEMPR) make sure the SQE is turned off. If your multiport transceiver does not have an SQE switch, find out from the manufacturer's handbook whether SQE is permanently turned on or off.
2. The subnet mask specified in the TCP/IP menu of GatorKeeper does not match the subnet mask used by the rest of the Ethernet backbone.
- a. Log into the host you are trying to reach and type the command `netstat -i`. The first column of the first line of the output will give you the primary interface name, for example `1e0`, `ie0`, etc.
 - b. Next, type `ifconfig <interface name>`. The output should show the subnet mask (in hex) recognized by that host. This should be indicative of the subnet mask being used by the rest of the net.
 - c. Enter the GatorKeeper TCP/IP configuration dialog box and verify that the entry in the **Subnet Mask** field matches the host's subnet mask. For example, if the GatorBox subnet mask is `255.255.255.0` the host's subnet mask should be `ffffff00`. Appendix H contains a Decimal-Hexadecimal table to help you convert these values.
3. The IP address of the GatorBox or the Macintosh may conflict with another device on the network.
- a. Look at the TCP/IP configuration menus in GatorKeeper to determine the IP address of the GatorBox.

- b. Determine the IP address acquired by the application. For example, while in NCSA Telnet you can see the network address by choosing **Network->Show Network Numbers**.
- c. Disconnect the GatorBox from the Ethernet. Then, on a UNIX machine that is on the same IP net as the GatorBox, type the command `ping <IP Address>` where `<IP address>` is that of the GatorBox. Repeat the command using the IP address of the application. If you receive a response then you know another device has the same IP address.
- d. The ARP cache on the machine to which you're trying to connect may associate the GatorBox IP address with the hardware address of a different device.

- If the host is a UNIX machine, type the command

```
arp -a | grep <IP Address>
```

This will display the routing table entry for this IP address. If you have the man pages installed, you can type the command `man arp` for more information about the `arp` command.

- Compare the Ethernet hardware address specified for this IP address to the Ethernet hardware address specified in the **Special->Info** window of GatorKeeper. If it does not match, then another device is using the same IP address as the GatorBox. Use the command `arp -d <GatorBox IP Address>` command to remove the conflicting entry and resolve the IP address conflict.



You must be the superuser to use the `arp -d` command.

4. If the host you are trying to reach is on a different IP network than the GatorBox, verify the default gateway entry in the GatorKeeper TCP/IP configuration dialog box. Make sure that the IP address is correct and that this is the machine that will connect you to the IP network of the server you are trying to reach.

MacTCP applications

1. If the host you are trying to reach is on a different IP network from the GatorBox, the default gateway must be specified.
 - a. If you have specified **IP Subnetting** in the **TCP/IP->MacIP Options** window in GatorKeeper, the default gateway specified in the MacTCP Control Panel should be the GatorBox's LocalTalk IP address.
 - b. If you are using **KIP forwarding**, the default gateway entry specified in the MacTCP Control Panel should be that of a host through which you can reach the destination network.
2. If you have specified IP Subnetting in the **TCP/IP->MacIP Options**, the host you are trying to reach may not know that the GatorBox is the gateway to the IP subnet.
 - a. Look at the routing table on the host you are trying to reach. If it is a UNIX machine, type `netstat -r`. An entry should be listed for the IP subnet (as specified in the TCP/IP->MacIP Options window) which identifies the Ethernet IP address of the GatorBox as the gateway.
 - b. If the routing table does not contain an entry for the IP subnet, you can add it by one of two methods:
 - Turn on the **Broadcast RIP** option in the TCP/IP menu of GatorKeeper if the remote host on your network supports RIP. To determine if your network supports RIP, log into a UNIX host and type `ps -aux | grep route`. (The command is `ps -ef | grep route` for System V Unix). If the `in.routed` process is running, then the network supports RIP.

or

- On the host, type `route add <LocalTalk IP subnet> <GatorBox Ethernet IP address> <distance>`. For example:

```
route add 192.31.5.0 192.31.222.236 1
```

If the man pages are installed on your UNIX machine, you can get more information about the route command by using the command `man route`.



You must be superuser to use the route add command.

3. The subnet mask entered in the MacTCP control panel may not match the subnet mask used by the rest of the Ethernet backbone.
 - a. Log into the host you are trying to reach and type the command `netstat -i`. The first column of the output will give you the primary interface name, for example `ie0`, `ie0`, etc.
 - b. Next, type `ifconfig <interface name>`. The output should show the subnet mask recognized by that host (in hex).
 - c. Select MacTCP from the Control Panel option on the Apple menu and verify that the subnet mask being used by MacTCP is the same as that being used by your host. For example, the subnet mask in MacTCP of `255.255.255.0` is equal to a host subnet mask of `ffffff00`. Appendix H, Decimal-Hexadecimal Conversion provides conversion for decimal numbers 1 to 255.
4. If you are trying to connect to a remote machine by using the machine's name, the GatorBox may not be able to resolve the name into an IP address.
 - a. Try using the IP address. If this works, make sure the application's configuration file contains the host's name and IP address. For example, in NCSA Telnet's `config.tel` there should be a line:

`name=<hostname>;hostip=<host IP address>`
 - b. If you are *not* using a domain name server, make sure that a domain name server is *not* entered in the MacTCP Control Panel. If it is, delete it and reboot the Macintosh.
 - c. If you *are* using a domain name server, make sure that the name server has been specified in the MacTCP Control Panel. Then, on the domain name server, type the command `ps -ax` (`ps -ef` on UNIX System V) and look for the `named` process. This verifies that the Domain Name Service is running on the machine specified.

The application launches but you can't connect

Remember, Domain Name Service is *not* the same as Yellow Pages, despite the use of the word "domain"



There is a name server address specified under the MacIP options->More menu of the TCP/IP configuration in GatorKeeper. This is NOT the same as a Domain Name Server. This option is only relevant to a very few applications, such as Brown's tn3270.

5. If you have selected **Manual** address assignment in the MacTCP Control Panel:
 - a. Verify that the manual address is *not* within the GatorBox's *dynamic* range specified in the TCP/IP->MacIP Options window of GatorKeeper.
 - b. Verify that no other Macintosh is trying to use the same address.
 - c. If there is another AppleTalk router such as a Hayes InterBridge or a Shiva NetBridge between your Macintosh and the GatorBox, you must select **Server** style address assignment in the MacTCP Control Panel. This is a general limitation of the MacIP protocol. The Macintosh will then get its address dynamically from the GatorBox.
6. If you have selected **Server** style address assignment in the MacTCP Control Panel and there is another AppleTalk router between your Macintosh and the GatorBox, then you must make sure that the zone name under the LocalTalk icon is the same as the LocalTalk zone in which your GatorBox resides.

Non-MacTCP applications

1. If the host you are trying to reach is on a different IP network from the GatorBox, the default gateway may not be specified.

- a. If you have specified IP Subnetting in the GatorBox, the default gateway specified in the application's configuration file must be the GatorBox's LocalTalk IP address. In NCSA Telnet's `config.tel` the syntax is:

```
name=<GBname>;hostip=<GB LocalTalk IP Addr>;gateway=1
```

For example, if you have configured the LocalTalk IP address of the subnet to be 192.31.5.0, the completed entry would read:

```
name=GatorBox1234;hostip=192.31.5.1;gateway=1
```

- b. If you have not specified IP Subnetting in the GatorBox, the default gateway specified in the application's configuration file and in the TCP/IP menu must be an IP router (or gateway) through which you can reach the networks other than your own. In NCSA Telnet's `config.tel` the syntax would be:

```
name=<routename>;hostip=<router IP Addr>; gateway=1
```

For example, if the backbone is network number 192.31.222.0, a complete entry would read:

```
name=Sun1; hostip=192.31.222.236; gateway=1
```

If the default gateway is a Berkeley UNIX machine, you can determine if it is configured to route by following these steps:

- Log into the default gateway and type the command `ps -ax / grep route`. If the process `in.routed` is running, then that machine is listening for routing information from the rest of the network.
- Next, type `netstat -i`. If there are 3 or more lines in the output, then this system is also set up as a router which will forward your packet to the remote network.

The application launches but you can't connect

- Finally, type `netstat -r` to confirm that the net you are trying to reach is in the routing table of the default gateway.
2. If you have specified **IP Subnetting** in the GatorBox, the host you are trying to reach may not know that the GatorBox is the gateway to the IP subnet.
 - a. Look at the routing table on the host you are trying to reach. If it is a UNIX machine, type `netstat -r`. An entry should be listed for the IP subnet (as specified in the TCP/IP->MacIP Options window) which identifies the Ethernet IP address of the GatorBox as specified in the TCP/IP->MacIP Options window.
 - b. If the routing table does not contain a entry for the IP subnet, you can add it by one of two methods:
 - Turn on the **Broadcast RIP** option in the GatorKeeper TCP/IP dialog box if your network supports RIP. To determine if your network supports RIP, log into a UNIX host and type `ps -aux | grep route`. (`ps -ef | grep route` for System V UNIX.) If the `in.routed` process is running, then the network supports RIP.

or

- On the host machine, type `route add <LocalTalk IP subnet> <GatorBox Ethernet IP address> <distance>...`For example:

```
route add 192.31.5.0    192.31.222.236  1
```

3. If you are using the machine's name instead of its IP address, the GatorBox may not be able to resolve the name into an IP address.
 - a. Try using the IP address. If this works then it is a name resolution issue.
 - b. If you are *not* using a domain name server, make sure the application's configuration file contains the host's name and IP address. For example, in `config.tel` there should be a line:

```
name=<hostname>; hostip=<host IP address>
```

- c. If you *are* using a domain name server, make sure the name server and its IP address have been specified in the application's configuration file. In NCSA Telnet's `config.tel` file the entry would be:

```
name=<server>;hostip=<serverIP addr>;nameserver=1
```

For example:

```
name=cayman;hostip=192.31.222.42;nameserver=1
```

On the domain name server, type the command `ps -aux` (`ps -ef` for System V UNIX) and look for the process named to verify that the Domain Name Service is running on the machine specified. You can also look in the file `/etc/resolv.conf` for the host that serves as the domain name server. Remember, Domain Name Service is *not* the same as Yellow Pages, despite the use of the word "domain."



There is a name server address specified under the MacIP options->More window of the TCP/IP configuration in GatorKeeper. This option is only relevant to a very few applications, such as Brown's tn3270.

Other problems

The following section contains information on less common problems, and miscellaneous notes on TCP/IP related subjects.

TOPS Terminal

This init will give the illusion that the GatorBox is out of MacIP addresses. It contends with the TCP/IP drivers in Telnet. The only way around this is to take the TOPS terminal CDEV out of the System Folder and reboot the Macintosh.

MacTCP with GateKeeper

MacTCP does not work if the anti-viral program GateKeeper is in the system folder. There is an override option for this program but that doesn't solve the problem. GateKeeper must be removed from the System Folder and the Macintosh restarted.

NCSA Telnet 2.3

Some NCSA Telnet-specific problems are listed below.

Telnet Process on the UNIX machine

Make sure that the Telnet daemon is running on the host to which you are trying to make a Telnet connection. If it is not, then the host will not respond.

To verify that the Telnet daemon is running:

- ▶ Type `grep telnet /etc/inetd.conf`. This will tell you if the `inetd` daemon is responsible for starting the telnet process only when requested. Then, verify that `inetd` is running using the `ps -aux` command; or
- ▶ Type `ps -aux` (`ps -ef` for System V UNIX) and look for the `telnetd` process.

NCSA Telnet and System 7

System 7 includes a change in the way in which NBP lookups are handled which caused the non-MacTCP version of NCSA Telnet to stop working with older versions of GatorSoftware. This System 7 change may also affect other MacIP applications.

If you are using the non-MacTCP version of NCSA Telnet from a Macintosh running System 7, you must use GatorBox software version 1.6.0X29 or later for the original GatorBox, or 1.6.1X3 or later for the GatorBoxCS.

"Can't RARP for IP address"

A Macintosh on Ethernet is trying to use an address within the GatorBox's range. If you chose `hardware=ether` in `config.tel`, then you must choose a static (not dynamic) IP address.

Telnet freezes

- ▶ You may find that invoking the `ls` command produces half a screen full of info and then the screen freezes. Try changing the `rwin` variable in `config.tel` to 256. In addition, you may try to set the `maxseg` variable to 256 as well.
- ▶ If you have an NCSA Telnet session that freezes after no activity for approximately 3 to 6 minutes, check the `config.tel` file for the following line:

```
timeslice=2 (or some other number)
```

If the line is preceded by a pound sign (`#`), then delete the pound sign. If the line is missing entirely, add it with the setting of 2. Make sure that the number defined is 2 or 1.

- ▶ If Telnet freezes, it may be that another device on the ethernet is using the same IP address as the GatorBox. The symptoms are that a Telnet into the Ethernet port of the GatorBox (i.e. from a Unix host) freezes immediately or after one or two commands whereas a concurrent telnet into the LocalTalk port (i.e. from a Mac on the same LocalTalk of the GatorBox) functions just fine.

To diagnose this, turn off the GatorBox or detach its Ethernet cable and ping the GatorBox's IP address (not the name). If you get a response, then you know this is the problem.

Maximum Telnet connections

The maximum number of Telnet connections is 64. This is due to the fact that the amount of memory reserved in the GatorBox for MacIP addresses is set at 64 entries.

MacTCP Name Resolver

NCSA Telnet 2.4 now uses the MacTCP name resolver instead of ignoring it and using its own name server code. This is very important to MacTCP applications like tn3270, MacX, HyperFTP, etc. This fix alone makes 2.4 very attractive.

The fix is currently in version 2.4b7, available by anonymous ftp at ftp.ncsa.uiuc.edu in the directory NCSA Telnet. Version 2.4 will be in full release soon. As of these notes, Cayman is still shipping 2.3.

ftp

Having the FlashBox init in the System Folder may interrupt ftp sessions from Telnet. This is true even without the init selected for the Network device in the Control Panel.

Can't configure dynamic addressing

This problem occurs when you select the **Network->Configure Network** menu and the word *dynamically* is grayed out.

- ▶ Verify that dynamic addressing has been configured in the **TCP/IP->MacIP options** of GatorKeeper.
- ▶ If you are using MacTCP, verify that **Server** addressing is selected in the MacTCP Control Panel.

Telnet after replacing a FastPath

A customer replaced a FastPath with a GatorBox using the same configuration. Routing worked but Telnet didn't. It turns out that the ARP entry on the UNIX host still had the hardware address for the Fastpath.

- ▶ On the UNIX host, type `arp -a` and note the entry for the old FastPath.
- ▶ Type `arp -d <IP address>`. The ARP cache entry would eventually time out, but this command removes it immediately.
- ▶ Quit and restart Telnet, then reopen the connection. The ARP cache should update according to the GatorBox.

3278 emulation

TCP/Connect or Brown's tn3270 are specifically designed to do (among other functions) 3278 terminal emulation. However, if you want to use NCSA Telnet for 3278 emulation here is how to set it up:

1. In `config.tel`, uncomment or insert the following lines


```
duplex=half
crmap=4.3BSDCRNUL
```
2. If you want to use the PF keys (these are kind of like function keys), use MacroMaker to assign the proper escape sequences to the function keys on the Apple extended keyboard.

l.n. notation

This notation was developed for use with the Fastpath and will work in the GatorBox. You must be sure to specify zone name (i.e., the AppleTalk zone attached to the GatorBox) in `config.tel` where it says "zone." Also make sure the LocalTalk zone names are unique.

PC Telnet

You can acquire telnet/FTP capabilities on PCs linked to an AppleTalk network using LocalTalk cards using one of the following packages.

- ▶ NCSA Telnet 2.3beta14 has a built in support for Appletalk. However, it currently supports only dynamic IP addressing, not static addressing. It will work from PCs on EtherTalk as well as LocalTalk. This can be obtained via ftp from zaphod.ncsa.uiuc.edu, [/NCSA_Telnet/PC.2.3beta/tel23bin.zip](http://NCSA_Telnet/PC.2.3beta/tel23bin.zip), or through anonymous ftp from ftp.cayman.com in the directory `pc-ncsa-telnet`

- ▷ Make sure that you have the following lines in `config.tel`:

```
Hardware=LocalTalk
```

```
Interrupt=60
```

- ▷ You must assign a static IP address and add the following line to `config.tel`:

```
myip=xxx.xxx.xxx.xxx
```

- ▶ NCSA Telnet 2.2TN modified at Clarkson and then at Princeton is similar to the version above. It also only supports dynamic IP addressing, but there may be some future support for static addressing. It can be obtained from princeton.edu, [/pub/pc3270.tar.Z](http://pub/pc3270.tar.Z)
- ▶ The KA9Q/LOCALTLK.COM combination currently able to do static addressing. However, the interface for A9Q is not as easy to use as NCSA Telnet packages. The KA9Q and LocalTalk packet driver can be obtained from ucdavis.ucdavis.edu, [/dist/packet/local/zip](http://dist/packet/local/zip) and [/dist/packet/netpkt.zip](http://dist/packet/netpkt.zip).

tn3270

This is a version of Telnet developed at Brown University which allows terminal emulation to IBM mainframes. There are no reported problems using it with a GatorBox.

DDP ARP

DDP style ARP does not support dynamic assignment of MacIP addresses.

IP fragmentation

The GatorBox did not perform IP fragmentation correctly before version 1.5.0 of GatorShare and GatorSystem. This is not a problem with applications like NCSA Telnet that do not do any packet reassembly.

The News

The News (a news reader for the Macintosh) requires static addressing in order to work.

GatorBox RIP Broadcasts

A GatorBox doing RIP advertises a distance of 16 to it's directly connected enet. The purpose is to prevent devices from thinking the GB is the preferred route to the backbone. The only devices which should legitimately be using the GB as their IP router are the Macs on the GatorBoxes LocalTalk-side,. This behavior doesn't cause them any problem.

Static addressing limitations

The MacIP protocol currently requires the use of dynamic addressing when there is a Netbridge or other AppleTalk router between your Macintosh and the GatorBox (or FastPath).

Given the current "pseudo standard" protocol for encapsulating IP inside AppleTalk, statically assigned addresses are not accessible from zones other than the LocalTalk zone of the gateway. This is because the gateway needs to establish a mapping between the AppleTalk address of the Macintosh and the Macintosh's IP address, just as ARP does with hardware addresses on Ethernet. With static addressing, no such interaction occurs between the Macintosh and the gateway.

Dynamically assigned addresses work because the Macintosh will request an IP address from the gateway. At the time of request, the gateway can remember the AppleTalk source address and complete the IP to AppleTalk address mapping.

Statically assigned addresses work on the GatorBox's local zone because the gateway will ARP for the Macintosh's IP address using NBP. Macintoshes in the local zone will see these lookups and respond. Macintoshes not in the local zone, like a Macintosh behind a Netbridge, will not see these lookups and will not respond.

Chapter 4

AppleTalk Routing

No zones appear in the Chooser

You only see the zones defined by the GatorBox

Devices selected in the Chooser fade in and out

Other problems

The most common indicators of AppleTalk Routing problems:

- ▶ You don't see any zones in the Chooser even though AppleTalk Routing is turned on in the AppleTalk Routing configuration menu of GatorKeeper.
- ▶ You see only those zones in the Chooser that were defined in the AppleTalk Routing configuration menu of GatorKeeper, but none of the other zones in your AppleTalk network.
- ▶ Devices selected in the Chooser fade in and out.

No zones appear in the Chooser

When you pull down the Chooser, your Macintosh requests a list of zones from the GatorBox or from the last router it heard from on its own LocalTalk. Problems can occur with the request, the response, or both.

1. There is only one zone defined in the entire AppleTalk network.

If there is only one zone, then the Chooser does not bother to display the name. You should still be able to see LaserWriters and other devices that are on remote LocalTalk networks. A single zone name can make troubleshooting quite difficult, since you can't detect a problem by the absence of a zone name which might be associated with a particular router.

2. The AppleTalk option on your Macintosh is set to *Inactive*. This shuts down the AppleTalk port (the one with the printer icon) on the back of the Macintosh.
 - ▷ Open the Chooser and look at the bottom right of the window to verify that AppleTalk is active.
3. The incorrect network connection may be selected in the Control Panel.
 - a. Open the Control Panel and select the Network icon.
 - b. If you are a Macintosh on LocalTalk, the "Built-in" icon should be selected.

No zones appear in the Chooser

- c. If you are on a Macintosh on Ethernet, the correct Phase I (single arrowheads) or Phase II (double arrow heads) icon should be selected.
4. The physical connection between the GatorBox and the Macintosh may be broken or unreliable.
 - a. If you have another Macintosh available on the same LocalTalk, see if that Macintosh can see zones. If it can, then it is likely the problem is specific to your Macintosh.
 - b. Open the Chooser, then wiggle the LocalTalk connections in the back of the Macintosh (the printer port) and the GatorBox (the top port). If zones appear, then the connection was loose.
 - c. Replace the LocalTalk connectors (i.e., the cable leading from the back of the Macintosh or GatorBox to the box) used by the Macintosh and the GatorBox.
5. The LocalTalk or PhoneNET cable may be inserted into the wrong port on the Macintosh.
 - ▷ Look at the back on your Macintosh and verify that the cable is inserted into the port with the printer icon next to it.
6. AppleTalk Routing may not be configured in the GatorBox.
 - ▷ Enter GatorKeeper and open the AppleTalk Routing configuration menu. Verify that AppleTalk Routing is on and that the correct network information is entered.

You only see the zones defined by the GatorBox

In this case you only see the zones defined in the AppleTalk Routing menu of GatorKeeper, and none of the other zones in your AppleTalk network. This usually indicates you have a good connection between your Macintosh and the GatorBox, but that the GatorBox is not receiving information over the Ethernet.

1. There is a problem with the physical connection between the GatorBox and the Ethernet network.
 - a. If you are using thick Ethernet, try swapping the transceiver. If you are using thin Ethernet, try swapping the t-connector or cable.
 - b. If you see the error message Ethernet Loopback failed in the GatorBox diagnostics log, then call Cayman Technical Support
2. There are problems with the multiport repeater to which the GatorBox is connected.
 - a. Switch the GatorBox to another, unused port on the repeater.
 - b. If the multiport transceiver on the back of the GatorBox has an SQE heartbeat switch, make sure it is turned off. Turning SQE on can confuse the GatorBox into thinking there are excess collisions on the wire.
3. There is a time-out problem, indicated by a message AR: Timeout waiting for AARP in the GatorBox diagnostics.
 - a. Check to see if slow links (T1, 56K lines, 9600 baud lines) are used within the same logical EtherTalk network. If they are, then it is possible that the request for zone information is timing out because either distance or traffic prevents routers on the other side of the links from responding quickly enough.
 - b. Determine whether another AppleTalk router or device on the same Ethernet wire as the GatorBox has gone down or been disconnected.
4. There is a network numbering conflict. This may be indicated by a message in the GatorBox diagnostics such as, "Port 0 conflicts with

existing bridge.” This message usually means that another router has been configured with the same LocalTalk or EtherTalk net number as the GatorBox's LocalTalk.

- a. Determine the LocalTalk and EtherTalk network numbers used by other routers or devices on the same Ethernet as the GatorBox. You can look at router configuration information, or use Inter•Poll, CheckNET, or other network monitoring software.
 - b. Look in the AppleTalk Routing configuration menu of GatorKeeper to verify that the GatorBox is configured using the same EtherTalk network number(s).
5. There is an EtherTalk Phase 1/Phase 2 conflict. This would occur if the GatorBox were configured from one type of phase and other routers on the Ethernet were configured for the other type of phase.

For example, if the GatorBox were configured for Phase 1 EtherTalk and the other routers were configured for Phase 2, the GatorBox would not see the other zones.

- a. Verify the phase being used on the EtherTalk. To do this, check the configuration of other AppleTalk routers or ask another system administrator.
- b. Go to several Macintoshes that are directly connected to the Ethernet. Pull down the Control Panel, and check which icon is selected under Network options. If the icon has single arrowheads, Phase 1 is selected. If the icon has “shadowed” or double arrowheads, Phase 2 is selected.
- c. If you are in “transition mode,” i.e., the GatorBox is configured for both Phase 1 and Phase 2, make sure that the EtherTalk Phase 2 net range is a single number (for example, net 3300 to 3300) and is assigned a single zone name.

Devices selected in the Chooser fade in and out

1. The LocalTalk network number defined by the GatorBox conflicts with another LocalTalk or EtherTalk network number.
 - a. If the message "AR: Port [0 or 1] conflicts with existing bridge" exists in the GatorBox diagnostics, determine the source of the conflict and change the conflicting device or the GatorBox.

If the message reads Port 1 instead of Port 0, this is an EtherTalk network numbering conflict. This is not as serious since the GatorBox will reset itself to that number dynamically. You may see a message to that effect, such as AR: Port 1: Network number overwritten; new network <####>. However there may be other devices on the net experiencing the same conflict so it would be best to correct the situation.

- b. Verify that the LocalTalk network number specified in the AppleTalk Routing menu of GatorKeeper is correct and unique.
 - c. If there is another AppleTalk router (for example, a Hayes InterBridge or Shiva NetBridge) on the same LocalTalk as the GatorBox, verify that the other router is using the same LocalTalk network number and zone name for the shared wire.
2. You may have an unreliable LocalTalk network connection.
 - a. Make sure that you have not exceeded the maximum number of devices on a LocalTalk segment (32 if you use Apple's LocalTalk cabling or 48 if you use a Star Controller).
 - b. Substitute different LocalTalk connectors and cables for those currently connected to the back of the Macintosh and the GatorBox.
 - c. If you are using PhoneNET, make sure the network is not overterminated. This is discussed quite well in the Farallon documentation.
 - d. Check your Ethernet cable or connection. Methods for troubleshooting Ethernet connection problems are discussed earlier in this chapter.

Other problems

AlisaShare

AppleTalk configuration data for AlisaShare resides in a text file on the VAX called PORTDESC.TEXT in the directory ATK\$ROOT:[AppleTalk]. Here is the format of the file:

```
INIT:ATKVLAP

OPEN:VLAP PORT:ATKVLAP:ALISA APPLTALK:8000

INIT:ATKAELAP

OPEN:AELAP PORT:ATKAELAP:ALISA ETHERTALK:0001
```

The first two lines refer to the 'virtual' AppleTalk network on the VAX. The last two entries on the 2nd line refer to the network name and number (in hexadecimal) respectively. The last two lines refer to the EtherTalk network, with the last two entries on the 4th line again referring to the network name and number (in hex). The 'virtual' AppleTalk network is NOT the same as the LocalTalk network of the GatorBox. The EtherTalk network IS the same as the GatorBox's EtherTalk network.

When you first bring up AlisaShare a configuration program asks you what network names and numbers you want to use and then creates the text file. Thereafter, if you need to make changes you must do it by hand (and then restart AlisaShare so that the changes take effect).

atalkad

atalkatab file

The atalkad -c command can be used to check the validity of your atalkatab file.

SunOS 4.1 and 4.1.1

atalkad boot and atalkad route don't work in SunOS release 4.1 and 4.1.1 due to a bug in the atalkad code on the Sun. We have verified this on SunOS 4.1 and SunOS 4.1.1 on both Sun-3 and SPARC.

The problem is a change to the way the OS handles interrupt system calls on the process' behalf. The boot and route features use software interrupts to attract the running atalkad process' attention, but in the new SunOS revs they don't manage to wake up the atalkad process. This problem applies to KIP version of June 1988 and prior versions of atalkad, as well as the KIP-Rutgers version.

The solution is to get atalkad from `munniari.oz.au` (128.250.1.21) version 1.25 or later for SunOS 4.1 or later. This is in either the multigate or mac directory.

GatorBox can't see atalkad zones, including its own

This problem occurs with atalkad software that is pre-January 1988. The symptom is that the GatorBox only sees zones that it hears about from a source other than the atalkad server. For example, it will hear about zones from a core router. The problem is that the atalkad server will not answer aazoneQ requests, only aazone requests. The GatorBox only sends out aazoneQ requests. The solution is to upgrade to atalkad software that is January 1988 or later.

PacerLink

No known problems.

PacerShare

The PacerShare software and the GatorBox must be configured so that the EtherTalk network numbers and zone names are the same. If you are using Phase I EtherTalk, you use PacerShare to configure this. If you are using Phase II EtherTalk, this is configured by AppleTalk for VMS.

To check the configuration of AppleTalk for VMS:

1. Log into the VMS system as "system".
2. Type `atsys@manager:atk@config`
3. At the `atsys@manager` prompt, type `show known ports`. The current configuration information is displayed.

4. To change the configuration, type `define port name <port> network range <#1> <#2>`, where <port> is the name of the port you obtained in the previous step, #1 is the first number in the EtherTalk Phase II network range, and #2 is the second number in the Phase II range.

TOPS for Sun

TOPS for the Sun has an EtherTalk net number hard coded. Make sure you either configure your GatorBox with the same network number or change the net number within TOPS using the `atconfig` command. See your TOPS manual for more information.

TOPS on a Sun sets the AppleTalk node address statically. Therefore, it is very possible to have node number conflicts with the Sun running TOPS having the same node id as another AppleTalk device on EtherTalk. Use the command `atconfig <net.node>` (e.g., `atconfig 3.156`), to configure your Sun system correctly.

Blank Zone in Chooser

If a blank zone appears in the Chooser, it may be that the KIP options are not initialized properly on the GatorBox. The GatorBox may believe there is a zone named " " and then includes this zone in its RTMPs.

1. Click **KIP Options** in the AppleTalk Routing window in GatorKeeper.
2. Click the **On** radio button in the KIP options window.
3. Then click the **Off** radio button in the KIP options window.
4. Click **OK** in all preceding all windows.
5. Choose **File->Save** in the GatorBoxes window.
6. Reboot the GatorBox.

Printing is slow from a Macintosh on Ethernet

Under Phase I EtherTalk, when printing from a Macintosh on Ethernet, a packet is passed to the last router seen and then forwarded to destination router. If packets were passed from a Macintosh to a router on the other side of a slow bridge (for example, a T50 link) and then back across the slow

bridge to the destination, you could experience this symptom. In one case, a customer replaced slow Ethernet-to-broadband bridges with faster bridges, resolving the problem.

"AppleTalk net number cannot be in the start up range."

The Phase II network numbers 65280 through 65534 are reserved for use by Macintoshes coming up on an ethernet where no router exists. Therefore, these network numbers cannot be configured on a GatorBox.

NBP Lookups from System 7

System 7 includes a change in how NBP lookups are handled. This can result in the GatorBox not appearing when you do NBP Lookups using CheckNET, Inter•Poll, or other NBP lookup utility. The solution is to use GatorBox software version 1.6.0X29 or later for the original GatorBox, or version 1.6.1X3 or later for the GatorBoxCS.

Chapter 5

GatorShare

Servers don't show up in the Chooser

"Unknown user or log on is disabled"

"Incorrect password, please try again"

"The attempted connection...failed"

Other problems

The most common indicators of GatorShare problems are:

- ▶ The servers you defined in GatorKeeper don't show up in the Chooser.
- ▶ The message "Unknown user or log on is disabled" appears after you enter your name and password.
- ▶ The message "Incorrect password, please try again" appears after you type your password, even though you know it was entered correctly and rechecked several times.
- ▶ The message "The attempted connection to the server's volume has failed" occurs after you attempt to mount a volume.



These error messages, which you see on the Macintosh, are from the AppleShare client software. They usually do not indicate the true nature of the problem. GatorBox diagnostics give you a much better idea, and are very important to troubleshooting GatorShare problems successfully.

Servers don't show up in the Chooser.

1. The servers were not configured in the **GatorShare Servers** menu in GatorKeeper.
 - a. Choose **Window->Servers** and make sure the server is listed with the correct IP address.
 - b. Double click on the GatorBox<name> icon in GatorKeeper and click on the **GatorShare Servers** option. Click on the server you want to change. Once in the server menu, configure at a minimum the **User/Group** information. Then restart your GatorBox.
2. There is an AppleTalk network numbering conflict.
 - ▷ Verify the AppleTalk and EtherTalk network numbers assigned in the GatorKeeper **AppleTalk Routing** configuration option. Make sure the numbers entered coincide with the network numbers used by other devices on the same network.

"Unknown user or log on is disabled"

Troubleshooting Tip

There are a number of reasons you might see this message, although that you are an "unknown user" or that "logon is disabled" is probably not one of them. The best way to proceed is to obtain the GatorBox diagnostics and troubleshoot according to the specific diagnostics entries that follow.

1. Choose ***Special->Diagnostics*** in GatorKeeper.
2. Go through the log on process again.
3. Immediately after the failure, check the end of the diagnostics. If you don't see any errors, click the ***Low*** radio button and try again. After obtaining the diagnostics, click on the ***High*** radio button before you close the Diagnostics window. Leaving the logging level on ***Low*** will affect the performance of the GatorBox.

"RPC: Portmapper failed... program 100003"

The complete message would read, "RPC: Portmapper failed for host <###.###.###.###>; program 10003". This message means that the GatorBox could not connect to the NFS process running on your NFS server. Reasons for this are:

1. The physical connection between the GatorBox and the server may be down.
 - ▷ On the server, type this command:

`ping <GatorBox IP Address>`

If you do not receive a response, then check the Ethernet T-connector or transceiver, changing them if necessary.
2. The IP address of the server may be incorrect or missing.
 - ▷ Choose ***Window->Servers*** in GatorKeeper, and verify the IP address of the server you are trying to reach.

3. The IP address of the GatorBox may conflict with another device on the network.
 - ▷ Disconnect the GatorBox from the Ethernet. Then, on a UNIX machine, type the command `ping <GatorBox IP Address>`. If you receive a response, then you know another device has the same IP address as the GatorBox
4. The server you are trying to reach is on a different IP network from the GatorBox, and the default gateway is incorrect in the GatorKeeper.
 - ▷ Verify the default gateway entry in the GatorKeeper TCP/IP configuration menu. Make sure that the IP address is correct and that this is the machine which will connect you to the IP network of the server you are trying to reach.
5. The portmapper daemon is not running on the server you are trying to reach.
 - ▷ On the server, type the command `ps -aux` (or `ps -e` on System V machines) and look for the portmapper process. If it is not running, you will have to start it. Check your server documentation to learn how to start the portmapper.
6. NFS is not running on the server you are trying to reach.
 - a. On the server, type the command `rpcinfo -p` and look for the entry for NFS. This tells you if NFS has been registered with the portmapper.
 - b. Next, type the command `ps -aux` (or `ps -ef` on System V machines) and look for the `nfsd` process. If it is not running, you will have to start it. Check your server documentation to learn how to start `nfs`.
7. The request to connect to NFS may be timing out.
 - ▷ Check the above diagnostics error message to see if it is preceded by an error code of "d10c". If so, enter the **GatorShare Servers** configuration menu in GatorKeeper. Once in the configuration window for the particular server, choose **Low Level Options** and change the **Timeout** value to 5000 milliseconds or higher.

"RPC: Portmapper failed... program 100005"

The complete message would read, "RPC: Portmapper failed for host <###.###.###.###>; program 10005." This message is seen primarily (but not exclusively) if you have configured the *GatorShare Servers* to use *Files* (for example, /etc/passwd and /etc/group) for authentication and indicates that the mount daemon may not be running on the server you are trying to reach.

1. On the server, type `rpcinfo -p` and look for the mount entry.
2. Next, type the command `ps -aux` (or `ps -ef` on System V machines) and look for the `mountd` process. If it is not running, you will have to start it. Check your server documentation to learn how to start `mountd`. On a Sun system, the command would be `/usr/etc/rpc.mountd -n`.

"0 MOUNT: mount of /etc failed..."

The complete message would read, "0 MOUNT: mount of /etc failed with error 13 - ownership violation." This indicates a problem with the /etc/exports file on the server you are trying to reach.

1. The /etc directory is not exported. The GatorBox needs to mount the /etc directory in order to read the /etc/passwd and /etc/group files used in Files style of authentication.
 - a. On the server, type the command `exportfs` and look for the file system /, or the directory /etc to be exported.
 - b. If neither / or /etc is listed, edit /etc/exports file to include the / file system. In the case of Sun computers, you can export just the /etc directory.
 - c. Type the command `exportfs -a` to reexport the file systems listed in the revised /etc/exports file.
 - d. If you make any changes, you must reboot the GatorBox. The GatorBox caches the exports list of a server. Rebooting the GatorBox will cause it to cache the new information.

2. The `/etc/exports` file is configured for restricted access and the GatorBox is not specifically authorized to mount the `/` file system.
 - ▷ On the server, type the command `more /etc/exports` and look for a list of host names next to the `/` file system. If there is no list, all host machines have access to that file system. If there is a list, the name of the GatorBox must be included.

For example, if you had the entry

```
/          hawaii
```

in the exports list, this would mean that only a machine named hawaii could mount that file system. You would edit the file so that the entry appears like this:

```
/          hawaii GatorBox07277
```

"d10c Open vol call failed"

This message in combination with the previous message "0 MOUNT: mount of /etc failed..." indicates that there was a timeout while trying to mount.

- ▶ Go to the **GatorShare Servers** configuration in GatorKeeper for that server. Choose **Low Level Options** and enter a higher value in the **Timeout** field, for example 5000 milliseconds.

"d0d1 Open vol call failed"

This message is almost identical to the preceding one except that it is preceded by the error code d0d1. In combination with the "0 MOUNT: mount of /etc failed..." message, it indicates that the GatorBox's name has not been entered correctly in the `/etc/hosts` file on the server you are trying to reach.

1. On the server, type the command `more /etc/hosts` and look for the GatorBox entry. If you are using NIS, use the command `ypcat <hostname> hosts`.
2. Make sure that the GatorBox name entered is exactly as it appears in GatorKeeper under your GatorBox's icon.

"Unknown user or log on is disabled"

3. If the name is correct, you may want to insert an alias name in the first entry slot that is all lower case. For example, the GatorBox entry might look like this:

```
192.31.222.236      gatorbox07277 GatorBox07277
```

Some machines require lower case entries in the `/etc/hosts` file.

"Unknown authentication type 0"

This usually occurs when the *User/Group* menu in *GatorShare Servers* has not been OK'd.

1. Choose *GatorShare Servers* in GatorKeeper and open the configuration menu for the server you are trying to reach.
2. Click on the *User/Group* option, verify that the information is correct, and click **OK**.
3. Click **OK** in the previous menu.
4. Restart your GatorBox.

"YP: No YP server responded..."

The complete message will read, "YP: No YP server responded for user <username> in domain <domainname>." It indicates that there is a problem communicating with a YP server for the domain specified in the *User/Group* menu of *GatorShare Servers*.

1. The broadcast address used by the GatorBox may be incorrect.
 - a. Log into the server you are trying to reach and type the command `netstat -i`. The first column of the output will give you the primary interface name, for example `1e0`, `ie0`, etc.
 - b. Next, type `ifconfig <interface name>`. The output should show the broadcast address recognized by that server.
 - c. Enter the GatorKeeper TCP/IP configuration menu and verify that the entry in the *Broadcast Address* field matches the broadcast address of the server.

2. If the NIS server is on the other side of an IP router from the GatorBox, the IP address of the router may not be defined as the default gateway.
 - a. On the server you are trying to reach, type `ypwhich`. This will tell you the name of the YP server for the system you are on.
 - b. Next, type `ypcat hosts | grep <yp servername>`. This will tell you the IP address of the YP server, so you can determine if it is on the same IP network as the GatorBox or a different one.
 - c. Go to the GatorKeeper TCP/IP configuration window and verify that the IP address of the router is entered in the **Default Gateway address** field.

"YP: Lookup of <username> ... failed ..."

The complete message will read, "YP: Lookup of <username> in Password Map of domain failed with error - no such key in map." This indicates that there is a conflict between what the user typed in and the authentication files used by the GatorBox.

1. The user name and/or password entered by the user was incorrect.
 - a. Log in directly to the server you are trying to reach using the same user name and password.
 - b. If you were able to log in to the server successfully, try to mount the server again in the Chooser. Make sure that you *completely* re-enter both your user name and the password to assure that no hidden characters (for example, a preceeding or trailing space) are entered.
2. The host is using secure password, for example, `/etc/shadow` files to contain encrypted passwords. Secure password files are not readable by any NFS client. The alternative is to use `pcnfs` authentication, which will make the password authentication request on behalf of the GatorBox
 - a. Change the authentication style to `pcnfs` in **GatorShare Servers**
 - b. Configure the host to run the `pcnfs` daemon.

"Unknown user or log on is disabled"

3. The user may not be registered with the Yellow Pages server.
 - a. On the server you are trying to reach, type the command `ypwhich` to determine the domain serving this host. Make sure that this domain matches the domain specified in the *User/Group* menu of *GatorShare Servers*.
 - b. On the server you are trying to reach, type the command `ypmatch <username> passwd`. If there is no match, add the user to the YP database, re-make the database, and push it out to the YP servers.
 - c. If there is a match, it's possible that your NFS server is using secure YP. If this is the case, you may have to use the *pcnfs* style of authentication in *GatorShare Servers* because the GatorBox does not support secure remote procedure calls (RPC) of any kind.

"Incorrect password, please try again"

This message indicates that the password is not available to the GatorBox because the server you are trying to connect to is using secure authentication, for example shadow password files or secure YP. The GatorBox does not currently support secure RPC.

1. Reconfigure your GatorBox
2. If necessary, change the style of authentication used by the GatorBox to *pcnfs*. To do this, enter the **GatorShare Servers** configuration menu for the server, click the **User/Group** button and click *pcnfs*. Click OK on all the menus, then restart the GatorBox.
3. Set up the *pcnfsd* process on the server.

"The attempted connection ... failed"

"The attempted connection ... failed"

The complete message would read, "The attempted connection to the server's volume failed." As with the "Unknown User or logon is disabled" message, the GatorBox diagnostics will give you a better indication of the problem than this message.

"d0d1 AFP: Open vol call failed"

"d0d1 RPC: Lower level problem"

"d0d1 MOUNT: mount of <volume name> failed ..."

The complete message would read, "d0d1 MOUNT: mount of <volume name> failed with error 13, ownership violation." These messages indicate that the GatorBox's name is incorrect in the /etc/hosts (or equivalent) file on the server you are trying to reach.

1. On the server, type the command `more /etc/hosts` and look for the GatorBox entry.
2. Make sure that the GatorBox name entered is exactly as it appears in GatorKeeper under your GatorBox's icon.
3. If the name is correct, you may want to insert an alias name in the first entry slot that is all lower case. For example, the GatorBox entry might look like this:

```
192.31.222.236      gatorbox07277 GatorBox07277
```

Some machines require the first entry to be lower case in the /etc/hosts file.

4. If you are using Yellow Pages, be sure to re-make the YP database after you modify the /etc/hosts file.

"d10c AFP: Open vol call failed"

**"d10c MOUNT: mount of <volume name>
failed ..."**

The complete message would read, "d10c MOUNT: mount of <volume name> failed with error 13 - ownership violation." This indicates a timeout problem for the GatorBox's request to the NFS server.

- ▶ Enter GatorKeeper and open the *GatorShare Servers* configuration menu for the server you are trying to reach. Choose *Lower Level Options* and enter a higher value (for example, 5000) in the *Timeout* field. Then, restart the GatorBox.

Other problems

DEC Ultrix

Copying a file that contains a "/" character in the file name to an Ultrix machine can cause that machine to crash. Make sure the "/" character is defined as illegal under the *Low Level Options* of *GatorShare Servers*.

Be sure to take out the "-i" option of the mountd command in /etc/inetd.conf. Leaving it in will prevent the GatorBox from being able to mount directories.

Berkeley UNIX

Some versions of Berkeley NFS have a bug that prevents uppercase entries to the /etc/hosts file from being recognized. The bug is this: If the first uppercase entry in /etc/hosts happens to be of an odd number of characters, for example GatorBox01234, then that host name will not be recognized by the system. For example if you try to ping GatorBox01234 on a Sun 3/280 it will fail saying "unknown host".

The workaround is to make the first host name entry all lowercase, and have subsequent entries mixed case. For example:

change this: 192.1.1.1 GatorBox01234

to this: 192.1.1.1 gatorbox01234 GatorBox01234

System V UNIX

Some System V UNIX machines use /etc/shadow files for password authentication. These files are not readable by anyone except the user root including the GatorBox. If a GatorShare server uses *Files* style of authentication, it will fail. Under these conditions, you must use *pcnfs* authentication.

Some System V machines have a command which lets them convert back to using /etc/passwd and /etc/group. The command is:

pwunconv

This command is available in System V release 3.2.2.

"Some files could not be written and were skipped"

This message used to occur if file name contained special characters that could not be used on the GatorShare server. Release 2.0 not maps these characters.

Copying Files with a / in the file name

File names that contain a "/" character and which were copied from the Mac to the NFS server using GatorShare cannot be removed using the UNIX `rm` command. They can only be removed by dragging them to the trashcan on the Mac desktop. If you want to be able to delete these files in UNIX, you must make the "/" an illegal character in the *Low Level Options* of *GatorShare Servers*.

Copying file with a "/" character to an Ultrix machine can cause that machine to crash. Make sure the "/" character is defined as illegal under the *Low Level Options* of *GatorShare Servers*.

Maximum number of servers per zone in Chooser

The maximum number of devices per zone in the Chooser (including servers) is, on average, 18 for System 6.0.3 or below, 36 for System 6.0.4 or above, and 9 for PC AppleShare. If there are more devices than can be displayed, devices may appear to fade in and out of the Chooser.

The actual maximum number is determined by the length of the device name and type, and the size of the buffer set up to hold the information displayed by the Chooser. The buffer is 512 bytes for 6.0.3 and below, 1024 bytes for system 6.0.4 and above.

The process is that the Chooser sends out an NBP packet requesting all devices of the selected type, for example type "LaserWriter." Responses are placed in the buffer. When the buffer is full, the Chooser list is displayed. If there are many devices of a given type in a zone, some of these devices may not be displayed immediately. If you leave the Chooser window open, however, the Chooser will continue to send out NBP lookups every 1.47 seconds. Due to a variance in response times, the devices which are included in this buffer may change. Therefore, you may see some devices appear and disappear in the Chooser window.

Maximum number of volumes per server in Chooser

Although the Chooser can display 16 volumes, GatorShare currently displays only 14. This is the total of the User's Home Directory, the Server's Export List, and any other user-defined mount points. The User's Home Directory always uses a slot even if it is not activated.

"Out of Finder Memory"

Try increasing the Finder Memory. Select the file "Finder" in the system folder, then choose **File->Get Info**. Once the window opens, increase the value which appears in the **Application Memory** box in the lower right hand corner of the window. Then restart your Mac.

"Disk needs minor repairs"

This usually means that there is a problem with your .DESKTOP file. The path to your .DESKTOP file may be incorrect as specified in GatorShare servers. If this is not the case, then delete the .DESKTOP file by logging onto the server and using the command `rm .DESKTOP`. Then remount the volume.

"AppleTalk couldn't handle any more connections."

This can occur if there are a large number of servers defined in GatorKeeper.

File is temporarily inaccessible

Files are locked when they are in use. This prevents two people from trying to change the same file at the same time. The GatorBox will "unlock" a file when it is closed or when the application quits.

When an application abnormally terminates, for example when the Mac crashes or the network becomes unplugged, it may take a few minutes for the lock to time out. Until the lock times out, no one will be able to access the locked range. This can result in users describing a problem such as "Sometimes I can read my file, sometimes I can't."

Mounting volumes as the user "root"

Mounting a volume as the user "root" will not work in most cases. This is because root (under NFS) has the privileges of a special user name of "nobody." Sun OS 4.0 has provisions for setting more useful privileges for NFS users logging in as "root," although it will still not give superuser privileges.

Read only mounts

In the case where a volume is exported read-only, the user will still be prompted for a name and password. NFS does not normally require user authentication. However, the GatorBox is also an AppleShare server. Therefore it must support the AppleShare semantics which require the password dialog. The GatorBox can only obtain the password by providing a user name which it can map to a user id number (UID), so it must use some external resource (password files, YP, pcnfsd) to provide the mapping.

In contrast to AppleShare where a name suffices, you must have a UID (user id number) to log in to an NFS machine. This UID is then used as the uid for operations to other NFS machines. If there's no password file to be used as a name-to-uid map, the GatorBox's only other alternative now is to ask YP to do the mapping.

Mount of mounts

You cannot mount a volume that is itself an NFS mounted file system on that server. You must mount the volume directly from the server from which that file system originates. This is an NFS limitation.

For example, if ServerA has mounted a file system from ServerB, you user GatorShare to log on to ServerA and mount a volume from that is really part of ServerB's file system. You must log onto ServerB to mount that file system.

Using hard links

If several names in the same directory are hard linked to the same actual file, the Macintosh Finder shows only one of the names.

Using symbolic links

GatorShare does not recognize symbolic links. It sees them as a file that can not be opened because it is in use by someone else. This is true of GatorShare document files or the `/etc/passwd` and `/etc/group` files used for authentication purposes.

UNIX and AppleShare access privileges

File permissions

AppleShare has no concept of protection on files. When you create new files, they inherit the permissions of the parent folder. However, any change to the permissions of a folder do not change existing files; only files created or copied to the folder after the change will be assigned the new permissions.

Default permissions

AppleShare always creates folders with '700' permissions. 700 translates to the owner having all permissions with group and world having no permissions. There are inits such as FolderShare and SAP that allow you to change the default permissions.

Groups

If a user's group id (GID) as assigned in password file used for authentication is not listed in group file used for authentication, then a ***Get Privileges*** will show the system default group name "wheel."

Files display with wrong date

GatorShare files will have the wrong date if the UDP time service is not running on the host and there are no user-defined mount points defined in GatorShare Servers. In absence of a UDP time server, the GatorBox will "touch" .DESKTOP file of the first user-defined mount point for the server and obtain the date. In absence of a user-defined mount point, the GatorBox fails to get a date and files are created and displayed with the incorrect date.

The workaround is to create a user-defined mount point that is writable by the person logging in. If you have multiple user-defined mount points, the first one must be writable.

PC AppleShare

There is a PC AppleShare bug which will drop NBP packets if the response packet is too large. This will occur if there are a large number of servers or servers with long names. This result is that no devices are displayed. The workaround is to limit the length of the device names, for example, to have server names each of a couple characters in length.

Intercon NFS Share

The init seems to prevent any other inits from loading after it.

"Can't create folder - unknown folder"

If you get this error message when you try to create a new folder on a GatorShare volume. Check to make sure a space is not configured as an illegal character in *GatorShare Servers*, in the *Low level options* window..

IBM 4361

Last verified April, 1991: GatorShare has been verified to work on an IBM 4361 running VM/CMS OS using Fibronics NFS.

Changing volume icons using System 7

System 7 allows you to copy a file or folder icon to another file or folder. However, you cannot do this to any shared file or folder. It is an AppleShare limitation.

Chapter 6

GatorPrint

GatorPrint diagnostics

Using GatorPrint with System V UNIX

"<lpr name>: unknown printer"

"Unable to get hostname"

"lpq:<lpr name>:unknown host <GatorBox name>"

"Connection to <GatorBox name> is down"

Waiting fo GatorBox<name> to come up"

Couldn't get AppleTalk printer status"

"<UNIX host>: waiting for queue to be enabled"

"<printer> not found during network lookup"

"<name>: GatorPrint: <lpr name>: unknown printer"

"Received print request for unknown printer"

"Offending command"

Print jobs sit in the queue on a specific host

Other problems

GatorPrint problems almost always have the same indicator - the file you tried to print is never printed. A better indication of the problem comes from viewing the print queue on the UNIX machine or viewing the diagnostics messages on the GatorBox.

GatorPrint diagnostics

If it appears that GatorPrint files are not being printed, follow these steps to test GatorPrint and obtain troubleshooting information. Note the output or error messages that each command gives you.

1. Clean and restart the queue for your printer.
 - a. Type `lpc`. You see the `lpc` prompt.
 - b. Type `clean <printername>` to clean the printer queue and spool directory.
 - c. Type `restart <printername>` to restart the printer queue.
 - d. Type `status <printername>`. The correct status is:


```
queueing enabled
printing is enabled
no entries
no daemon present
```
2. Print a test file, for example, the `/etc/printcap` file.
 - ▷ Type the command `lpr -P<printer name> <filename>`.
3. View the printer queue.
 - ▷ Type the command `lpq -P<printer name>`.
4. Determine the status of the printer again.
 - a. Type the command `lpc`
 - b. When the `lpc` prompt appears, type `status <printer name>`. Make note if the status is any different from the response listed in step 1.

5. In GatorKeeper on your Macintosh, choose *Special->Diagnostics* and note any messages from [Print Service].
6. Remember to clean and restart the printer queue as specified in step 1 before attempting a new test.

Using GatorPrint with System V UNIX

If your UNIX System V machine does not support the lpr printing protocol, you will need the lprclient software from Cayman Systems. This is an unsupported program developed by Cayman which allows the lp protocol to simulate the remote printing allowed by the lpr protocol.

The lprclient software must be compiled on your system. In some cases, the program may require some modifications in order for it to be successfully compiled.

The lprclient software is available through anonymous ftp from ftp.cayman.com, in the directory "GatorPrint" and via AppleLink in the CAYMAN.TECH account. If you do not have access to the internet or AppleLink, call Cayman Technical Support (617/494-1999) to request a copy.



The commands used in this troubleshooting section are specific to Berkeley UNIX systems. You can follow the same steps for System V machines using commands native to that system.

Compare the lpq and diagnostics errors you obtain to the messages below, and troubleshoot accordingly.



If you make corrections and want to test them out, make sure that you clean and restart the queue before you try to print again. Instructions for emptying the queue are provided in the "GatorPrint Diagnostics" section at the beginning of this chapter

From the lpr command

"<lpr name>: unknown printer"

This error message indicates that the printer has not been entered into the /etc/printcap file.

- Type `grep <printrname> /etc/printcap`. If there is no response then the printer has not been configured in the /etc/printcap file with that name. Refer to your GatorPrint documentation for guidance on configuring your /etc/printcap file.

"Unable to get hostname..."

From the lpq command:

"Unable to get hostname..."

lpq:<lpr name>:unknown host <GatorBox name>"

The complete message might read, "Unable to get hostname for remote machine <GatorBox name>." It indicates that the machine specified in /etc/printcap is not in the /etc/hosts file.

1. The GatorBox has not been specified in the /etc/hosts file on the UNIX machine.
 - a. On the UNIX machine, type the command `more /etc/hosts` and look for the entry of the GatorBox. If your network uses Yellow Pages, type `ypcat <GatorBox name> hosts`.
 - b. Make sure that the GatorBox name entered is exactly as it appears in GatorKeeper under your GatorBox's icon.
 - c. Make sure that the IP address matches the IP address specified in the TCP/IP configuration in GatorKeeper.
 - d. Some machines require lower case entries in the /etc/hosts file. If the name is correct, you may want to insert an alias name in the first entry slot that is all lower case. For example, the GatorBox entry might look like this:

```
192.31.222.236  gatorbox07277  GatorBox07277
```

2. The `rm` (remote machine) field in the /etc/printcap file is incorrect.
 - a. Type `more /etc/printcap` and locate the entry for the printer you used with the `lpq` command.
 - b. Compare the entry in the `rm` field with the name of the GatorBox as it appears under the GatorBox<name> icon in GatorKeeper and in the /etc/hosts file.

From the lpq command:

"Connection to GatorBox<name> is down"

This message indicates that the lpr daemon cannot communicate with the GatorBox.

1. The physical connection to the GatorBox is down.
 - a. On the UNIX machine, type the command `ping <GatorBox IP address>`.
 - b. If you do not receive a response `<GatorBox IP Address>` is alive, try pinging another machine on the same network.
 - c. If other devices answer but the GatorBox does not, then check the GatorBox's Ethernet T-connector or transceiver, changing them if necessary.
2. The `/etc/printcap` file on the UNIX machine does not contain the right name in the `rm` field of the GatorBox printer entry.
 - a. On the UNIX machine, type the command `more /etc/printcap` and look for the entry for the GatorBox printer.
 - b. Verify that the `rm` field for the GatorBox printer matches the GatorBox name in `/etc/hosts`.

"Waiting for GatorBox<name> to come up"

From the lpq command:

"Waiting for GatorBox<name> to come up"

The GatorBox is not registering itself as having print services.

1. In GatorKeeper, select the GatorBox, choose *Special->Info* and look to see if the GatorPrint software is resident.
2. If you are using TFTP download, re-ftp the file making sure that binary is on and Machinery is off.

From the lpq command:

**"Couldn't get AppleTalk printer status
<UNIX host>: waiting for queue to be enabled..."**

From the GatorBox diagnostics:

"[Print Service] <printer> not found during network lookup"

The complete diagnostics message might read, "[Print Service] <printer name>.<type>.<zone> not found during network lookup." These messages indicate that the configuration information in GatorPrint Printers may not match the Chooser.

1. The **LocalTalk Printer Name** defined in **GatorPrint Printers** of GatorKeeper may not match the printer name in the Chooser.
 - a. Compare the **LocalTalk printer name** defined in **GatorPrint Printers** configuration of GatorKeeper to the printer name that appears in the Chooser.
 - b. Make sure that there is no trailing space. Some older versions of the "Namer" used to add a blank character to the end of the device name.
 - Select the printer in the Chooser.
 - Choose **File->Print**. When the print menu appears, the printer name is enclosed in quotes. Notice if there appears to be a space between the end of the name and the closing quote mark. For example:

LaserWriter "Cone Head "

If there is, add a space to the end of the **LocalTalk Printer name** defined in GatorKeeper and restart the GatorBox.

- c. Make sure the printer name is not more than 34 characters.

"[Print Service] <printer> not found during network lookup"

2. The **LocalTalk Zone** defined in **GatorPrint Printers** may not be the same zone the printer is in.
 - ▷ Compare the **LocalTalk Zone** in **GatorPrint Printers** to the zone in which the printer appears in the Chooser.
3. If there is a router between the GatorBox and the LocalTalk printer, then that router may be down.
 - ▷ See if you can display the printer in the Chooser from a Macintosh in the same zone as the GatorBox.
4. The **Printer Type** field in **GatorPrint Printers** may be incorrect.
 - ▷ Compare the **Printer Type** defined in **GatorPrint Printers** with the type you select in the Chooser, for example, LaserWriter or ImageWriter.
5. If you are using a GatorBox that is downloading from a UNIX TFTP server, the file may not have been transferred correctly. Use ftp in binary mode, with MacBinary disabled, to re-ftp file image file to the host.

"<name>: GatorPrint: <lpr name>: unknown print-

From the lpq command:

"<name>: GatorPrint: <lpr name>: unknown printer"

From the GatorBox diagnostics:

"Received print request for unknown printer..."

These messages indicate that the printer name specified in the *rp* field of */etc/printcap* does not match the printer name specified in the **Printer LPR Name** field in **GatorPrint Printers** menu of GatorKeeper.

1. Type `more /etc/printcap`. Locate the entry for the printer you used in the `lpr` command and note the name specified in the *rp* (remote printer) field.
2. Compare the *rp* name in */etc/printcap* with the **Printer LPR Name** in the **GatorPrint Printers** configuration of GatorKeeper.

"Offending command..."

From the lpq command:

"Offending command..."

This message usually indicates that there was an unexpected (i.e. non-PostScript) character in the file that the printer could not process.

1. An ASCII file was not converted to PostScript before it got to the printer.
 - ▷ Make sure that the **Use Text-to-Postscript filter** option is selected in the GatorBox Printer configuration.
2. The file was processed to non-standard Postscript on the UNIX host machine.
 - a. Check to see if **Text to PostScript Filtering** is selected in GatorKeeper. If it is selected, then the GatorBox will filter any file it receives where the first two characters are not %! (standard Adobe PostScript 2.0 convention), assuming that it is not already PostScript. If the file WAS already PostScript, the filtered file will be garbage to the printer. Try turning off the filter.
 - b. Check to see if the **Map International Characters** option is selected in the **GatorPrint Printers** configuration. Text that is converted to PostScript on the host system rather than in the GatorBox may modify the standard PostScript code assignments, limiting the effectiveness of international character mapping in the GatorBox.

If it is selected, then either:

- Turn international character mapping off in the GatorBox; or
 - Change the /etc/printcap file so that files are NOT converted to PostScript on the UNIX machine, for example as specified in the if, of, nf, rf, or cf fields of the /etc/printcap file. Then select **Text to Postscript filtering** in the GatorBox. If you do this, you must use the GatorPrint "Text to Postscript" option or pre-process the file on the Unix machine.
- c. Make sure that you are not using filters as specified in the

Print jobs sit in the queue on a specific host

This may happen after a user removes a job from the queue. You must be the superuser (root) to remove a GatorPrint job. If you are not, the GatorBox ignores the job termination message from the lpr daemon.

The result is that the job appears to be removed from the queue on the UNIX machine, but the GatorBox is still waiting for more data. As long as the GatorBox thinks it has an active connection, it will not accept new jobs from that UNIX machine. The only way to remove the connection at this point is to reboot the GatorBox.

The correct way to remove a print job is:

1. Become the superuser.
2. Type the command `lpq -P<printer name>` and determine the queue number of the job you want to remove/stop.
3. Type the command `lprm -P<queue job#>`.

Other problems

"Can't unlock file" error from lpq

This may occur if the spool and error logs defined in `/etc/printcap` (i.e., the `sd=` and `lf=` fields, respectively) do not exist or do not have the correct permissions.

Files sent to two separate printers print on one printer

If you sent two files to two separate printers but both files were printed on the same printer, check to see if separate spool directories have been specified for the two printers in the `printcap` file. This may happen if multiple printers share a spool directory, because when the line printer daemon finishes processing a job, it looks in its spool directory to see if there's anything else to do. If there's a file there, it will send it to the same printer to which it sent the last job.

Maximum Length AppleTalk Printer Names

GatorPrint AppleTalk printer name (Chooser name) can be a maximum of 28 characters. The same length restrictions applies to a zone name as well.

Banner Pages

GatorPrint can't print banner pages. This is a general limitation because of the way `lpr` sends data and control files.

Silicon Graphics

Last verified March, 1991: There was one occasion when the `lpr` name had to be "lp." The accompanying error message from `lpr` was "unknown printer".

lprclient: "...error on line 27..."

This error message may appear when using the `addpr` command with `lprclient`. Edit the `addpr` file and remove the parentheses before and after the variable `LPRCLIENT`.

GatorPrint on VMS

GatorPrint has been verified to work with TGV Multinet and Process NFS software for VMS machines.

PC-Soft

Last verified April, 1991: PC-Soft conflicts with Gatorprint. PC-Soft, which emulates 286pc's on unix, is designed to send print jobs out in batches. It appears to add an unrecognized postscript character at the end of the first job in a batch which causes GatorPrint to flush out the remaining jobs.

Apple Print Server Software

Last verified April, 1991: This software adds the text "<space>Spooler" to the end of a printer name. In conjunction with the version of the namer which adds a trailing space to the printer name, this will create a printer name with two spaces between the name and the word "spooler", for example if the printer name was hurricane, the Apple Printer Server software would create a printer name of "hurricane<space><space>spooler"

GatorPrint documents print double spaced

GatorPrint's *Text to Postscript filter* takes carriage returns and turns them into carriage returns/line feeds. If the document coming from a host already has carriage return/line feeds, GatorPrint's filter will insert another one making the document double spaced.

IBM RS6000

An IBM RS6000 running AIX uses the file `/etc/qconfig` instead of `/etc/printcap` file. The GatorPrint printer entry in `/etc/qconfig` should look like this:

```
lp:
    device = cpst
    up = TRUE
    host = <GatorBox name>
    s_statfilter = /usr/lpd/bsdshort
    l_statfilter = /usr/lpd/bsdlong
    rq = <GatorPrint lpr name>

cpst:
    backend = /usr/lpd/rembak -N
```

The `host` field correlates to the `rm` field in `/etc/printcap`. The value should match the name entered in the `/etc/hosts` file and be the same as the name appearing under the GatorBox icon. The `rq` field correlates to the `rp` field in `/etc/printcap`. The value should be the same as the ***lpr Printer Name*** field entry in the ***GatorPrint Printers*** configuration menu.

Chapter 7

Bridges, Gateways and Transceivers

Adaptec Nodem
Apple Internet Router
Cisco Router
DEC LanBridge
DELNI
DEMPR
DESPR
Ether+
Farallon Star Controller
Hayes InterBridge
Shiva (Kinetics) FastPath
Kinetics Ethernet Cards
Multiport Repeaters
Proteon IP router
Shiva NetBridge, NetModem, TeleBridge
UShare

Adaptec Nodem

No known problems.

Apple Internet Router

Last verified May, 1991: The Apple Internet Router running in transition mode (i.e., configured for both Phase I and Phase II EtherTalk) sends NBP forward requests instead of directed broadcasts on the Phase I wire. Since Phase I devices do not recognize NBP forward requests, the Phase I devices do not respond. The result is that devices in Phase II zones will not see devices in Phase I zones.

Cisco Router

The Cisco router passes Appletalk packets and thus can be used without tunneling.

Versions of the AppleTalk router code prior to 8.2(3) contain a bug whereby the Cisco will add a checksum to a DDP packet which it is routing and which did not have a checksum previously. This would cause problems with CE's Quickmail used across a Cisco and in conjunction with the GatorBox. Versions 8.2(3) and later fix this problem.

DEC LanBridge

Not verified: A customer has reported that some GatorBox problems (including crashes) went away when they upgraded ROMs on a Lanbridge 100.

DELNI

Digital Equipment Local Net Interface. The repeater may send out garbage packets if it is directly connected to a DELNI that has the heartbeat turned on.

DEMPR

Digital Equipment Multi-Port Repeater. No known problems. Make sure the SQE heartbeat function is turned off.

DESPR

Digital Equipment Single Port Repeater. No known problems. Make sure the SQE heartbeat function is turned off.

Ether+

Beta versions of the Ether+ did not support short DDP packets. This means that the Ether+ will not decode RTMP packets in short DDP packets and thus will not see the GatorBox zones. This is now fixed.

Farallon Star Controller

Last verified April, 1991: The PN301 is an integrated PhoneNet to LocalTalk plug the design of which will not work with the GatorBoxCS. After talking with Farallon, it seems that the PN301 has problems with other products, such as ImageWriters.

You can still use the standard PhoneNet-AppleTalk adaptors with the "pigtail".

Hayes InterBridge

- Not verified: Some sites have reported problems with Interbridges suddenly losing routing information. This occurs with both FastPaths and GatorBoxes, so it is suspected to be an Interbridge specific problem although this has not been verified. Try rebooting the Interbridge.

- ▶ Last verified July, 1991: An Interbridge with pre-2.1 ROMs can cause phantom zones to appear in the Chooser. These are zones which may have at one time existed but which no longer exist. The InterBridge will correctly time out the routes but hang on to the zone names. You have to power cycle the InterBridge.
- ▶ Last verified June, 1991: In large Phase II networks where the RTMP is too large to fit into a single packet, the first packet sent by an Interbridge with 2.1 ROMs exceeds the maximum length allowed. This causes the GatorBox to drop the packet.

Zones from the other side of the Interbridge will seem to fade in and out for Macintoshes that are on the net shared by the Interbridge and the GatorBox; the zones will appear if the Macintosh made its zone list request to the Interbridge. Zones from the other side of the Interbridge will not display at all for Macintoshes on nets not shared by the Interbridge and the GatorBox..

Kinetics (Shiva) FastPath

No known problems.

Kinetics Ethernet Cards

A customer reported that the Macintosh II, IIfx or IIfx using a pre-2.3 EtherTalk driver would hang when a user tried to copy a file. The customer also reported that the Macintosh would hang sometimes when printing certain files (this would be independent of the GatorBox). The GatorBox diagnostics would show lots of AARP time-outs. These problems were cleared up when they upgraded the EtherTalk driver to 2.3.

The 2.5 EtherTalk driver also works but includes AppleTalk Phase II support. If you use the 2.5 EtherTalk driver and have a Phase I or mixed Phase I/II network, be sure to specify both Phase I and Phase II support in the Network Control Panel.

Multi-port Repeaters

No known problems.

Proteon IP router

The Proteon router does not pass Appletalk packets and thus requires the GatorBox to use IP tunneling in order to communicate with devices on the other side of the Proteon.

Shiva NetBridge, NetModem, TeleBridge

No reported problems. If you are using NCSA Telnet from a Macintosh that is behind a Netbridge which is then connected to a GatorBox, the config.tel file must contain an entry zone=<zone in which the GatorBox resides>, and you must use dynamic addressing. The MacIP protocol has a limitation which prevents the use of static addressing in this configuration.

UShare

No reported problems.

Chapter 8

Cabling

AppleTalk cabling

Ethernet cabling

AppleTalk Cabling

PhoneNET, Modunet

- ▶ There have been a couple of cases where PhoneNET didn't work and the cable had to be replaced. The symptom was usually a GatorBox in a *Can't Find* status. Try changing the cable.
- ▶ Also, if you experience unreliability with PhoneNET cabling and the connections appear to be tight, try removing some terminators. PhoneNET terminators are simple 100 ohm resistors that permit surges to cross over between the black and yellow wires. The more resistors there are, the more signals can cross over causing increased unreliability.

Farallon discusses this in their documentation. There should be a terminator at each end of the backbone and one for each stump off of the backbone. The number of terminators should be governed more by the physical length of wiring to the next terminator than by the number of devices on the network. If a LocalTalk zone is small, this should not be a problem.

Apple's "LocalTalk" cables have a higher impedance combined with a higher voltage. Although this arrangement doesn't permit LocalTalk cables to cover as much distance as do Farallon's PhoneNET or Modunet which use a lower impedance and voltage, it does cause error free transmission.

- ▶ An entry in the Farallon Star Controller manual (p. 36) mentions that the FastPath puts out less voltage than a Macintosh, and therefore maximum cable runs to a FastPath cannot be more than half as long as the maximum cable length to a Macintosh. The GatorBox does NOT have this limitation. We use the same output driver chip as the Macintosh, and operate over the same voltage range (-5 to +5 volts).

LocalTalk Cabling Specifications

The maximum length of LocalTalk cabling is 300 meters using 22 gauge shielded cable.

Ethernet Cabling

Thick Ethernet Cabling Specifications

Specifications for thick (transceiver) cabling are:

500m maximum single segment

2500m maximum with repeaters

100 nodes per segment

2.5m minimum spacing

Thin Ethernet Cabling Specifications

Specifications for thin ethernet cabling are:

185m maximum single segment

925m maximum with repeaters

30 nodes per segment

0.5m minimum spacing

Chapter 9

Third Party Software

Macintosh init conflicts

End-User applications

NFS versions

Macintosh init conflicts

The most common problems associated with init conflicts are problems with downloading and with GatorKeeper crashing. If you suspect an init conflict, reboot the Macintosh from the system start up diskette and try to reproduce the problem. If this solves the problem then gradually re-add each init until you discover the init causing the problem.

Disinfectant

Verified: If you are experiencing conflicts with various anti-viral inits, Disinfectant version 2.4 is known to work with GatorBox software. Version 2.5.1 has been released but has not been verified. This release will only work on a Macintosh model 512E or later, and running System 6.0 or later.

FlashBox

Not verified: Having the FlashBox init in the System Folder may interrupt ftp'ing from Telnet. This is true even though the init is *not* selected for the Network device in the Control Panel.

GateKeeper

Not verified: This is an anti-viral init that may cause GatorKeeper to hang. There is an override option for the program but it doesn't solve the problem - it must be removed from the System Folder and the Macintosh restarted.

MacPuke

Not verified: This init causes an inability to unmount Appleshare volumes.

SAM Intercept

Not verified: This anti-viral init appears to conflict with the GatorBoxTFTP init.

TOPS Terminal

Not verified: This init will give the illusion that the GatorBox is out of MacIP addresses. It contends with the TCP/IP drivers in Telnet. The only way around this is to take the TOPS terminal CDEV out of the System Folder and reboot the Macintosh.

End-User applications

HyperCard

Not verified: Version 1.2.2 of HyperCard had a problem trying to access stacks on a remote volume because it stored stacknames with names such as "HyPeRcArD". You should have no problem if you use version 1.2.3 or later of Hypercard.

Interleaf

Interleaf is a publishing system that runs on Macintoshes, Suns, Vaxes, and numerous other systems. If you have Paint, Draw or Write files that you want to incorporate into your Interleaf document, you will need to run a set of filters on them.

1. Copy the Paint, Draw, or Write file to the UNIX machine using GatorShare. The **GatorShare Servers** configuration should specify AppleDouble format.
2. Refer to the Interleaf documentation to determine the appropriate filter to use.
3. Run the Interleaf filter on the data file (i.e., the file without the percent sign) using the -h option. Apple Double data files do not have a header and the -h option tells the filter that there will not be a header.

Microsoft Word

If you have "Convert TEXT files" selected in GatorShare Servers and you are saving directly from MS Word to a remote volume, text conversion does not work correctly. The problem lies in the fact that MS Word does not write the file type (for example, TEXT) until the end of transaction so there is no way for the GatorBox to know that it has to do the conversion until it is too late.

Not verified: One customer reported problems when saving Word files on a Convex system. The first save worked correctly but subsequent saves failed. It was discovered that for subsequent saves, Word creates a temporary file called "word<space>temp" and then moves that file to the existing file name. The Convex system did not allow files with spaces to be created, so the save failed.

Oracle

Not verified: When using Oracle on a UNIX machine, make sure that all of the driver files (orcldrv, ocidrv, and two others which end in "drv") and the TCP/IP drivers which Oracle uses to talk to TCPPort are copied using both upper and lower case names. For example, you should have both orcldrv and ORCLDRV. This is done on the Unix side. If you are using AppleDouble, you will have to change the resource forks of each of the drivers as well.

Redux

Not verified: The GatorBox does not permit incremental backups with Redux because of problems that it has with modification dates.

StatusMac

GatorShare 1.6.0 and 1.6.1 prevents the storage and writing of the StatusMac data file on a GatorShare server. GatorShare does not support end relative file writes which Status Mac uses when creating data files.

NFS versions

TGV MultiNet

Last verified, March, 1991: There are no known problems using GatorShare or GatorPrint with this NFS software for VMS machines.

Wollongong

Last verified May, 1990: Although this section refers mainly to Wollongong, a lot of the information will be applicable to other implementations, such as Fusion NFS.

Wollongong's implementation of NFS doesn't create the passwd and group files in the format of a standard UNIX passwd file. Wollongong has written a program called creuser.exe to do this. This program creates a passwd file and you can then give the standard path to the file (called pwfile).

You may also have to create a group file that looks like the UNIX group file. This should be done although it is only checked for the Access Privileges function. Check the notes below.

A customer reported the following with Wollongong's v3.2 NFS: He tried to mount a volume which was not in the exports list on his NEC386 running Wollongong. The problem that occurred was that port 2049 (on the NEC), which services NFS, was allocated to the GatorBox.

Usually, the nfs daemon respawns itself so that other machines can access that port (in this case, you would be able to type `netstat -a` and see port 2049 "listening"). However, once the GatorBox tried to mount this non-exported volume, port 2049 became permanently allocated to the GatorBox. The result was that no other machine could access NFS services on the NEC.

In order for you to be able to copy Macintosh applications to a remote server, you have to set the read/write sizes to 1024. Text files seem to copy correctly but applications do not.

The syntax for specifying paths to directories and files differs between UNIX and VMS. Since GatorKeeper expects a UNIX-style path, you must first define logical names on the VMS side that represent a path and that look like UNIX names. To define a logical, edit the file `nfslog.com`. by defining `/sys/trans=concealed twg$nfstdra1 "doc$dra1:"`

Define is a DCL command for defining logical names.

`doc$dra1` is a logical that has already been defined to represent disk drive `dra1`.

`Sys` and `trans` are called switches, a VMS name for options.

`/sys` causes the logical to be added to the system logical definition table. The user must have `SYSNAM` or `SYSPRV` privileges to do this.

`trans` refers to the translation attributes. When the attribute is concealed, messages that refer to that device will specify the logical name instead.

The name in quotes (called the equivalence name) can be a device name, another logical name, or a string.

`twg$nfstdra1` is a logical that represents the server `dra1`. Now that the logical is defined, `nfstdra1` refers to that server. Note that `twg$` need not be referenced explicitly. `twg$nfstdra1` can be thought of as an environment constant as used in UNIX. Although it is legal, it is not advisable for logicals to reference other logicals.

Wollongong sets up a directory called `tcp:[netdist.etc]`. Its function parallels the `/etc` directory in UNIX. That is where the `passwd` and `group` files are normally kept. `tcp` is a logical that refers to a system and a disk drive.

Without logicals, the correct VMS syntax would be:

```
system::disk:[directory.subdirectory]
```

After the logicals are defined, this directory can then be referenced by `/nfsdra1/netdist/etc/` in the Mount Points option and the User/Group option of GatorShare Servers.

Chapter 10

Third Party Hardware

Alliant
Amdahl
Apollo
AT&T
Apple
DEC (Digital Equipment Corporation)
Gould
Harris
Hewlett Packard
IBM
Interactive Systems
Intergraph
NeXT
Pyramid
SCO
Silicon Graphics
Sun
Symbolics

Alliant

Last verified January, 1990: To telnet to an Alliant machine, you may have to add every IP address in the MacIP range to the Alliant's hosts table. If you do not do this, you will get a connection to the machine but never a login prompt. For example, if the range in the GatorBox is 192.1.1.11 to 192.1.1.13, you must add:

192.1.1.11 Mac1

192.1.1.12 Mac2

192.1.1.13 Mac3

Amdahl

No known problems

Apollo

- ▶ If authentication fails and the diagnostics return a message such as "Cannot read password in passwd file" then you may be using an older version of the Apollo OS. OS SR9.7 used nonstandard password encryption. Although SR10 uses standard encryption, Apollo permits mixed token ring networks. Thus if the master registry is on a machine with SR9.7, this problem will happen even though the machine which you are trying to mount is running SR10. There may also be a problem if the majority of machines are running SR9.7 because the master machine will have to translate their password files. A higher **Timeout** value under **Low-Level Options** of **GatorShare Servers** will fix this.
- ▶ There is a bug in the early versions of Apollo NFS 2.0 where only about 15 elements are seen. There is a patch which increases that number to about 160. The bug was where it would only return one packet of information containing file names. If there were a lot of files or the file names were really long, only the files and directories whose names fit into the first packet would be seen. (Apollo patch kit M68k-8905 Patch M0012).

- ▶ TCP/IP is bundled with the Domain OS, so SR10 users should be all set. With SR9, they did need an additional product, of which Apollo sells two: ComTCP (for Aegis) and Domain IX (which is a Berkeley IP). Also any TCP product for the Aegis environment will work fine.
- ▶ Last verified May, 1991: There is problem whereby an SR9 machine mounted through an SR10 machine with // exported, acting as the ENET/Token Ring, gateway will have its extended accls damaged.
- ▶ Last verified May, 1991: GatorShare files will have the wrong date if the UDP time service is not running on the Apollo and there are no user-defined mount points defined in *GatorShare Servers*. In absence of a UDP time server, the GatorBox will "touch" a .DESKTOP file on the server and obtain the date. The problem is that the GatorBox unmounts the default mount points (the Exports List and User's Home Directory) following authentication, making it impossible to touch the .DESKTOP file. However, user-defined mount points remain mounted after authentication. Therefore the workaround is to create a user-defined mount point.

AT&T

3B2

AT&T used to ship a version of Wollongong TCP with their 3B2's that caused problems with the GatorBox. First, the broadcast address comes preconfigured to be 0.0.0.0 and is not changeable. The second problem is that it does not support BSD socket management correctly and thus does not support CAP. Post 3.0 versions of Wollongong TCP takes care of both of these problems.

WSG

Last verified April, 1991: This is a new model of the AT&T 386 machine. (It is not a 3B2.) NFS transfers that require WriteCompletion calls work only if the read/write sizes for that server on the GatorBox are less than or equal to 1024. Specifically, the file can't be copied if both its size and the read/write sizes are greater than 1024.

To change the read/write size, enter the *GatorShare Servers* configuration for the WSG machine, click on **Low Level Options**, and enter 1024 in the **Read/Write Size** field.

Apple

Macintosh running A/UX

- ▶ A/UX 1.0 could not export more than one file system.
- ▶ A/UX file names cannot be longer than 16 characters so some file names may be truncated.
- ▶ When building the A/UX kernel, it is possible that typing:

```
autoconfig -v -S /etc/startup -I -o /unix
```

may not work correctly. It sometimes does not prompt you for interface information such as the IP address, the netmask, and the broadcast address. If it doesn't, then it will not create the NETADDRS file. Without that file, portmapper cannot start even if it is uncommented in the inittab file or if you try to start it manually.

Instead, try building the kernel with:

```
autoconfig -v -m /etc/master.d -I -o /unix
```

This works much more consistently. It will rebuild the kernel, enable any changes that were made to inittab, and start NFS.

To check which modules are loaded, type `module_dump`. Both `nfs` and `BNET` must be running. If not, use `newunix` to add them and rebuild the kernel as above.

- ▶ If you are downloading a Gatorbox using TFTP from files stored on an AU/X machine, make sure you use either GatorShare or NCSA Telnet/FTP to transfer the download files to the A/UX partition. It is very easy to copy the files from an HFS Mac to the AU/X using a floppy, however they are transferred in Mac format. The download will fail using these files because the TFTP download option expects the files to be in non-Mac format.
- ▶ To read a floppy for an A/UX machine, do the following:
 - a. Put the disk in the drive.
 - b. Type: `mount -o ro /dev/floppy0 /mnt`
 - c. Type: `cd /mnt`
 - d. Type: `ls -l`
 - e. Type: `cd /`
 - f. Type: `umount /mnt`
 - g. Type: `eject`

MacPlus

A folder is included on the GatorSystem (or GatorPrint or GatorShare) diskette marked "For MacPlus Only". Make sure that you install AppleTalk file in this folder into the System Folder. The ROM of the MacPlus does not contain the complete AppleTalk code and this file patches the ROM to be current with the rest of the Macintosh lines. This ROM update file is distributed on the same disk as GatorKeeper.

DEC (Digital Equipment Corporation)

VAX/VMS with Ultrix Connection

- ▶ There are two mount points: `/vmsnfs` and `/vmsroot`. `/vmsnfs` is actually an Ultrix file system within a VMS directory. It should behave very much like an Ultrix system as long as file naming is kept in mind (see below). The other mount point, `/vmsroot`, is an alias for device `dua1:` which is the VMS system disk.
- ▶ You must use legal VMS syntax when naming files. In particular, you have to be sure that the desktop file is not called `DESKTOP`. Try renaming the desktop file in `/vmsnfs` to `DESKTOP`. Basically, just use alphanumeric characters and punctuation such as periods and underscores.
- ▶ Home directories do not work on this machine because there is no way to map the home directory with a VMS home directory.
- ▶ The ULTRIX Connection has a bug where even though the proper file systems have been exported, the VAX returns an error message that the directories couldn't be found in the exports list: failed to find file in Export database filesystem `/<dirname>`.

The problem was resolved by giving the container file the same name as the file system to which it is being bound. Do the following:

- a. Create the Container file.
- b. Bind the disk, e.g. UCX bind disk1: `"/disk1"` and bind the Ultrix file system, e.g. UCX bind `<diskname>` `"/dirname"`
- c. Export the file system.

To see what has been exported, type `show proxy`. Information about exported file systems is contained in:

- `UCX$export.dat`
- `UCX$proxy.dat`
- `UCX$host.dat`

VAX/Ultrix

- ▶ Copying a file with a "/" character to an Ultrix machine can cause that machine to crash. Make sure "/" is defined as an illegal character in the *Low Level Options of GatorShare Servers*.
- ▶ Be sure to take out the "-i" option of the mount command in /etc/inetd.conf. Leaving it in will prevent the GatorBox from being able to mount directories.
- ▶ You may find that invoking ls within a telnet session produces half a screen full of info and then the screen freezes. Try changing the rwin variable in config.tel to 256.
- ▶ You have to delete the -r option from inetd.conf to make tftp booting work.
- ▶ Ultrix does not accept mail from a host that is not in the hosts file.
- ▶ Last verified: February, 1991: Ultrix running on DecStation3100's has another bug in the YP code. When the GatorBox asks a DecStation3100 who its YP server is, the DecStation sends back the IP address in reverse order. The GatorBox subsequently tries to talk to a non-existent IP address (the reversed IP address returned by the DecStation3100). To see the evidence for this type the following command: ypwhich -d <domainname> <hostname>

On some systems, this behavior is caused by having the "trailers" option enabled for ifconfig. To make sure that trailers is off, modify the ifconfig command in the /etc/rc.local file to read:

```
ifconfig <interface> -trailers
```

Gould

Last verified September, 1989: Gould's implementation of NFS may not support exporting directories other than the top level of the file system.

Harris

Last Verified January, 1990: The Harris machine uses a non-standard TFTP so downloading to a GatorBox will not work correctly.

Hewlett Packard

- ▶ The HP does not support the time daemon so you may see messages containing "ICMP: destination unreachable". GatorShare files will have the wrong date if the UDP time service is not running and there are no user-defined mount points defined in GatorShare Servers. In absence of a UDP time server, the GatorBox will "touch" a .DESKTOP file on the server and obtain the date.

The problem is that the GatorBox unmounts the default mount points (the Exports List and User's Home Directory) following authentication, making it impossible to touch the .DESKTOP file. However, user-defined mount points remain mounted after authentication. Therefore the workaround is to create a user-defined mount point.

- ▶ If the user gets an 'Invalid user' error after entering their name and password in chooser, this could be due to the fact that mountd isn't running. Check this with `rpcinfo -p`. Uncomment the `rpc.mountd` entry in `/etc/inetd.conf` (this file calls up `inetd` which runs the portmapper).
- ▶ HP-UX 7.03a uses a System Administration Manager (SAM) interface for modifying certain system files, for example, the `/etc/printcap` file. To add a printer to `/etc/printcap`:

Select **Peripheral Devices->Printer and Plotters ->Add a Remote Printer**.

Complete the menu. The SAM fields correspond to the `/etc/printcap` fields as follows:

<u>SAM field name</u>	<u>/etc/printcap field name</u>
Printer name	<code>lpr</code> name
Remote system name	<code>rm</code> field entry
Remote printer name	<code>rp</code> field entry

SAM creates a file called `/usr/spool/lp/interface/printer_name`, and the contents of the file are exactly the same as the r-model script in `/usr/spool/lp/model`.

IBM

IBM RS 6000

- ▶ AIX on the RS 6000 does *not* store passwords in the standard password file, `/etc/passwd`. The standard password file does exist, but all that it contains is an exclamation point (!). The encrypted password is stored within another file (`/etc/security/paswd`) in a much different format from the standard file.

Users have two options for authentication:

- ▷ You can use `pcnfs` style of authentication, which means that you must create mount points for *each* users home directory - (assuming this is where they want to be mounted).
- ▷ Obtain the encrypted passwords from `/etc/security/paswd` and create a dummy file (in another directory) in the format that the standard UNIX uses. Then point the GatorBox to this file in the *User/Group* menu of *GatorShare Servers*.

MVS NFS

GatorShare was incompatible with this version of NFS. This has not recently been verified.

AOS 4.3 on IBM RT

Last verified October, 1990: If you see the message, "`xdr_bytes: bad size FAILED`" the problem is a bug in the AOS code. `NFS_MAXDATA` was 4096 instead of 8192 in the AOS 4.3 Dec 88 kernel. Any NFS client talking to an RT server using a write size greater than 4096 would eventually hit this problem.

The solution is to set the read/write size to 4096 or less in *Low Level Options* in *GatorShare Servers*.

VM/CMS

Last verified April, 1991: GatorShare has been verified to work on an IBM 4361 running VM/CMS OS using Fibronics NFS.

AIX

No reported problems.

Interactive Systems

- ▶ Interactive Systems uses a shadow password file which the GatorBox cannot handle. The solution is to manually move the encrypted passwords from the shadow password file into the `/etc/passwd` file or into another file to which you point the GatorBox.
- ▶ Interactive NFS versions prior to 2.1 do not allow access restrictions in the `/etc/exports` file (e.g. `'/etc access=GatorBox01234'`). If there are restrictions, the GatorBox will not be able to mount and diagnostics will show a diagnostic message of `"d00d..... mnt. export rpc failed."` Version 2.1 and later of Interactive NFS fixes this problem by allowing access restrictions.

Intergraph

These comments apply to Intergraph's NFS for VMS, *not* Intergraph's UNIX machine.

- ▶ The `passwd` and `group` files should be created in stream-linefeed format. The default format for the commonly used editor EDT is variable length record format, which will not work.
- ▶ AppleDouble format will not work because VMS doesn't like file names which have `%` characters. (Wollongong's NFS for VMS gets around this problem by mapping unusable characters before passing the file to VMS). Release 1.5 or later of GatorKeeper lets you circumvent the VMS restriction by specifying the leading character used for resource fork file names.

NeXT

Configuring the NeXT as an NFS server for GatorShare

Following are instructions for configuring a standalone NeXT machine that is running NetInfo to serve as a GatorShare server. If the machine is not standalone but is either a NetInfo client or server, refer to your NeXT documentation

1. Add the GatorBox and its IP number to the hosts database.

The normal `/etc/hosts` file is *not* used by NetInfo. You can add the GatorBox by using the NetManager utility, or by following the steps below.



Note the space before and after the period in each command.

2. Type the command `nidump hosts . > /etc/hosts.`
3. Edit the resulting `/etc/hosts` file to add the GatorBox and its IP address.
4. Type `niload hosts . < /etc/hosts` to add this information to the netinfo database.
5. Add the file systems or directories you wish to mount from the Macintosh to the `/etc/exports` file . If you are using Files authentication for GatorShare, make sure that `/` or `/etc` is included in list.
6. Run NetManager and choose Local Configuration... from the menu.
7. Choose non-NetInfo Network. Remember, these instructions are for a stand alone NeXT machine running NetInfo
8. Enter the IP address, hostname, netmask, broadcast address, and default gateway of the NeXT machine.
9. If you are using Yellow Pages (NIS) for GatorShare authentication, then select and enter the YP domain name.

10. Click on Save.
11. Three question panels (NeXT refers to "dialog boxes" as "panels") will appear. Click Yes for all three. The machine will now reboot. This will let the NeXT use the new configuration and will also start the nfs and mount daemons.
12. If you are using Files authentication for GatorShare:
 - Type `nidump passwd . > /etc/passwd`
 - Type `nidump group . > /etc/group`



Note the space before and after the period in each command.

These commands move the respective NetInfo databases into files which can be accessed by the GatorBox. This is necessary because the GatorBox is not permitted to access NetInfo directly and it must access this information in order to authenticate Machintosh users when they log in to the NeXT. Any time you make changes to these NetInfo databases (e.g. by adding a user) you must execute the appropriate `nidump` command again so that the GatorBox will have access to the updated information.

Configuring the NeXT as a TFTP download server

In `/etc/inetd.conf`, comment out the `/tftp` entry pointing to `/private/tftp`, and uncomment the regular `/tftp` entry.

Pyramid

- GatorShare only works with version 4.4b or greater of the Pyramid OS. Previous implementations included Pyramid's own version of NFS which was not completely compatible with Sun NFS. One thing to note, however, is that the GatorBox's name must be entered in lower case in the `/etc/hosts` file.
- To mount the root (`/`) file system, you must mount enter `"/."` (note period after slash) into the `/etc/exports` file.

SCO

Last verified June, 1991:Running GatorPrint on an SCO UNIX machine using lprclient may require you to modify replace the GatorBox name with its IP address in the lpr_printers file. The error from lp on the UNIX side was "printername: tcp-open could not connect". In the GatorBox diagnostics, the error was "[print service] received from ...%% [error:timeout; offending comand:timeout]%%".

Silicon Graphics

- ▶ Not verified: If you are experiencing randomly dropped NFS connections, try increasing the *Timeout* field in *Low Level Options* to 5000 milliseconds. This has fixed problems on some SGI machines.
- ▶ Version 3.3.2 of the Silicon Graphics operating system provides support for the lpr protocol. If this support is installed (it is optional) there is no need for the lprclient software in order to use GatorPrint.

Sun

Sun Workstation

- ▶ Sun OS 3.5 only allows you to export file systems, not directories.
- ▶ Sun OS 4.0 has a secure TFTP option. You can tell if you are using secure tftp by looking for the following line in the file `/etc/inetd.conf`.

```
tftp dgram udp wait root /usr/etc/in.tftpd in.tftpd -s /tftpboot
```

If you are using secure tftp, you must specify `/tftpboot` as the directory from which to do the download. Because secure tftp makes the root directory `/tftpboot`, you only need to specify as much of the pathname as is different from this directory. For example, if the data files are in `/tftpboot/GatorBox`, enter `/GatorBox/` and the pathname to the data files.

- ▶ Sun 1's and 2's do not support a Read/Write size of greater than 1024 bytes. The symptom is the message `GatorBox diagnostics error, "NFS Write RPC failed."` Read/Write sizes can be configured in the **Low Level Options** dialog box in *GatorShare Servers*.
- ▶ If you are using NIS (also called Yellow Pages) authentication, you must be sure to have an alias for the GatorBox in the hosts file which begins with a lowercase letter. For example, ****put this in GatorShare section****

Sun 386i (aka RoadRunner)

- ▶ The 386i has separate `passwd`, `group`, and `alias` files for Yellow Pages (`yppasswd`, `ypgroup`, etc). If you are running Yellow Pages, make sure that you either make your changes to these files or use Sun's `yppasswd` program.
- ▶ If you are trying to Telnet to a 386i, make sure that the `networking_plus` software cluster is installed. Verify this by issuing the `loadc` command. If it is not installed, Telnet will open a window and then close it immediately.

Symbolics

- ▶ Last verified May, 1989: Some patches to the Lisp^m NFS were required to make GatorShare work well. These changes include adding code to report the modification times of directories, which keeps AppleShare from constantly re-enumerating a mounted volume. If you have ordered but not yet received NFS from either ILA or Symbolics, you will get the new version (11.2). If you have a previous version of ILA NFS and have purchased maintenance, you should ask for an upgrade.
- ▶ Currently you must use **Files** rather than **Yellow Pages** authentication in **GatorShare Servers**. Files in UNIX format called `passwd` and `group` should be installed in the root directory of the Lisp^m file system, and referred to as `/passwd` and `/group` in GatorKeeper.
- ▶ The correct size for READ and WRITE operations to a Lisp^m server is 1136 bytes. The Lisp^m cannot handle packets larger than 1500 bytes, and 1136 bytes is the size of a Lisp^m file block.

Appendix A

GatorBox Troubleshooting Tools

Using GatorBox diagnostics

Memory statistics

Using Telnet to query a GatorBox

GatorBox routing tables

Crash signatures

Network monitoring tools

Anonymous ftp

Using GatorBox diagnostics

The diagnostics is a log of activities and errors that occur with the GatorBox. This log can be extremely helpful in troubleshooting GatorBox problems. Appendices B and C contain information about specific diagnostics messages.

When you have a problem that you suspect involves the GatorBox:

1. Reproduce the problem.
2. Immediately review the GatorBox diagnostics. You can access the diagnostics log in two different ways:
 - ▷ Choose *Special->Diagnostics* in GatorKeeper. This displays the current diagnostics buffer; OR
 - ▷ Telnet to the GatorBox and type the command `show log`. This displays the log 25 lines at a time.

If you see no recent messages that appear to relate to your problem, try setting the log level to "low" and reproduce the problem again. After you have the diagnostics and before you close the Diagnostics window, click the "high" option box. If you leave low logging on, it will affect the performance of your GatorBox dramatically. Changing the logging level can only be done when you view diagnostics in GatorKeeper, not when you telnet to the GatorBox and use the `show log` command.

The following example explains the meaning of each column in the diagnostics log.

Date	Time	Log Level	Code	Type	Description
2/24/91	10:34:30	L3	d0d1	AFP	NBP register succeeded

- ▶ Date — The month/day/year the entry was logged. The date and time are both calculated from the Macintosh running GatorKeeper.
- ▶ Time — The time hour:minute:second the entry was logged.

- ▶ **Log level** - Specifies diagnostics message reporting level. For example, a logging level of "High" will produce L3 and L4 messages, but will not display L1 or L2 messages.
- ▶ **Code** — The associated GatorBox error code. Not all entries have an error code. Appendix D has information on specific error codes.
- ▶ **Type** — The protocol which logged the message. Common types are:
 - AR — AppleTalk Routing
 - AFP — Apple File Protocol
 - IP — Internet Protocol
 - MacIP — Macintosh Internet Protocol
 - RPC — Remote Procedure Call
 - ICMP — Internet Control Message Protocol
 - AARP — AppleTalk Address Resolution Protocol
- ▶ **Description** — The message that was logged.

Memory statistics

GatorBox memory statistics are obtained by choosing *Special->Statistics* in GatorKeeper. You can use these statistics as a method of monitoring the load being placed on the GatorBox. If the amount of free memory falls below 100K, it indicates that the GatorBox is being used too heavily or that there may be a problem with the GatorBox. If you suspect memory problems, you should call CaymanTechnical Support.

The GatorBox Reference manual carries a more complete description of the Memory Statistics window.

GatorBox routing tables

Looking at a GatorBox's AppleTalk routing table can help you find out what network numbers are in use on your AppleTalk network.

A little known but useful feature in GatorKeeper is the ability to see a GatorBox's AppleTalk routing table. This is actually a dynamic view of the routing table getting updated and provides an interesting glimpse into the

workings of an AppleTalk router. To find this table, launch GatorKeeper. Then, in the GatorBoxes window, choose **Special->Statistics**. Once the Memory statistics display, click on the screen. You will see a screen with the following columns. An explanation of the column headings follows.

<i>Networks</i>	<i>State</i>	<i>Port</i>	<i>Dist</i>	<i>NextRouter</i>
12	ok	2	1	22200.130 (86.184.130.1)
15	suspect	2	1	22200.91 (86.184.91.1)
17	ok	1	0	

As you watch the screen you will see the screen refreshing as various parameters change. These changing parameters reflect information arriving from other routers on the network. For a more complete understanding of how routing tables are built please see the GatorBox Reference topic "AppleTalk Routing."

Networks

This is the network number assigned to the remote network or to a directly connected network (ie. a network which connects to one of the GatorBox's ports).

State

Once the GatorBox learns about a remote network and adds it to the routing table, that network entry starts to age out. It is only maintained as long as the GatorBox continues to hear from another router that the network is still alive. There are three states associated with a network:

- ▶ **ok** means that the GatorBox heard about the network within the last 20 seconds. This state lasts for 20 seconds.
- ▶ **suspect** means that the GatorBox has not heard about the network for 20 seconds. This state lasts for 20 seconds
- ▶ **bad** means that the GatorBox has not heard about the network for at least 40 seconds. This state lasts for 40 seconds.

Therefore, the total amount of time from which the network was last heard from and when it will be removed from the routing table is 80 seconds.

Port

This describes the port through which the GatorBox heard about the route. Typically, port 1 is the LocalTalk port and port 2 is the Ethernet port. However, if you're using the tunneling feature or atalkad, the port numbers after 1 may change, i.e., a tunnel port (logical) may be port 2 and the ethernet port 3.

Distance

This describes the number of routers a packet has to traverse to get to the remote network. If you have 10 other routers on your backbone, each network behind those routers would be considered to be a distance of 1 away from the GatorBox. A distance of 0 means that the GatorBox is directly connected to that network.

Next Router

This is the AppleTalk address of the next router on the way to the remote network. In the above example, the 22200.91 reflects the node address of the router which is next on the path to network 15. In this case, because the distance is 1, you also know that network 15 is directly connected to that router.

Using Telnet to query a GatorBox

You can telnet to the GatorBox either as a convenience or to obtain information that is not available from GatorKeeper, for example:

- ▶ IP routes and ARP cache
- ▶ AppleTalk routes, zones, and ARP cache
- ▶ Current GatorShare users

To discover the information available from the GatorBox telnet shell, telnet to the IP address of the GatorBox from a Macintosh or an ethernet host. Once you are at the GatorBox prompt, type the command:

```
GatorBox01234> help
```

Or, for further information about a specific command:

GatorBox01234> **help show**



The show log command may not display the date and time of a diagnostics message correctly.

Crash signatures

A crash signature is a list of the GatorBox's registers and pointers that allows Cayman's engineers to determine what the GatorBox was doing when it crashed. If your GatorBox crashes, get the crash signature and either fax it (617/494-5167) or email it via internet (support@cayman.com) or AppleLink (Cayman.Tech) to Cayman Technical Support. To print a crash signature:

1. Restart the GatorBox and wait for it to reach a status of "Running."
2. Launch GatorKeeper and single click on the **GatorBox<name>** icon. Then choose **Special->Info**. The Info window appears.
3. Click on the GatorBox icon in the upper right-hand corner. The crash signature window appears.
4. Choose **File->Print** to print the crash signature or **File->Save as Text**. if you are going to e-mail it.
5. When the crash signature is printed, choose **Edit->Clear** to delete the crash signature.



If the crash signature is not cleared, a new crash signature will not be written.

Network monitoring tools

There are several tools that can provide information useful in troubleshooting your network. For example, there are software products such as Farallon's CheckNET, AG Group's EtherPeek, Apple's Inter•Poll or hardware/software combinations such as a Sniffer. Etherfind and Watch are two programs that are readily available and are described below.

etherfind

This is a packet collection utility available on Sun workstations. The full range of etherfind commands is listed in the man pages. Several simple ones are included here. To terminate an etherfind command, press the control and D keys simultaneously (^D).



You must be superuser to use the etherfind command.

```
etherfind [-tx] [-between host1 host2] [-host host1]
```

where:

-t shows all packets

/-x shows a complete hex dump

-between host1 host2 shows all packets between two hosts, defined by host1 and host2

[-host<host1>] is show all packets to or from <host1>

For example:

This command lists all the packets between the hosts *GatorBox01234* and *cayman*:

```
etherfind -t -between GatorBox01234 cayman
```

This command lists all the packets going to and from the host *cayman*:

```
etherfind -t -host cayman
```

Watch

Watch, a packet capture utility developed by Cayman, is free to both customers and non-customers. It can be run on a Macintosh that is on either Ethernet or LocalTalk, and decodes the IP and AppleTalk packets it captures. It is not a Cayman supported product. However, it has proved extremely useful in troubleshooting network problems.

What You Need to Run Watch

You need a MacII and, if running Watch on ethernet, an ethernet card that is made by Apple, Asante, or Interlan. Unfortunately, Watch does not currently work on a MacIIx or other ethernet cards and does not currently support any of the SCSI ethernet adapters.

How to Get Watch

Watch is available from the following electronic sources:

- ▶ anonymous ftp from ftp.cayman.com (internet address 143.137.1.2)
- ▶ anonymous ftp from sumex-aim.stanford.edu (internet address 36.44.0.6)
- ▶ macnet, in Cayman's forum
- ▶ AppleLink, in "Third Party Software," "Software Upgrades"

Tips for Using Watch

- ▶ You can output the packets in Sniffer format. By using the Apple File Exchange you can then view these packets with a Sniffer. Make sure you add the extension **.enc** to the end of the file name.
- ▶ You can't output packets to a text file, only in Watch and Sniffer format. This is a known bug.
- ▶ When you want to look at a specific packet detail, make sure that packet is in the upper fourth of the display screen.

- ▶ On a color screen, different protocols are represented by different colors.
- ▶ Watch 1.6.4 (not yet available at print time) will be able to decode EtherPeek packets.

Anonymous ftp

If you have access to the Internet, you may be able to obtain software from various sources by *anonymous ftp*. This means that you can use the program ftp to log in to a remote system. These remote systems have been specifically set up to provide limited access to anyone who logs in using the standard login name anonymous and the password guest. Once you have logged in, you can retrieve files from that location.

At Cayman Systems, we have set up a directory to allow customers to download software such as Watch, UDPTFTP init and others. This manual occasionally references other locations that use anonymous ftp.

What you need to use anonymous ftp

- ▶ Experience with NCSA Telnet or a comparable product.
- ▶ Access to the internet. Ask your network or system administrator for the name of the system that serves as the gateway to the internet at your site.
- ▶ Depending on the file you are retrieving, you may also need the product StuffIt®. Information on obtaining StuffIt® is provided at the end of this section.

How to ftp from Cayman Systems

The following describes how to use anonymous ftp to obtain software from Cayman Systems. You can also use these steps as guidelines to ftp information from sources other than Cayman.

Retrieving files from an internet host



If this procedure does not work at your site, you should ask assistance from your network or system administrator.

1. From your Macintosh, telnet to the host that serves as the gateway to "the Internet." You can ask your network or system administrator for the name and/or IP address of this system.
2. Once you have logged in to the internet gateway, type the command `ftp ftp.cayman.com`.
3. At the login prompt, type `anonymous`. At the password prompt, type `guest`. Once you have successfully logged in, the `ftp>` prompt displays.
4. Type the command `ls`. This lists the directories in your ftp location.
5. Type `cd <directory name>` to change to the directory you want to get to. For example, type `cd pub` to get to the pub directory.
6. If you want files that are in a sub-directory of pub, then `cd` to that directory. For example, type `cd Watch`.
7. If the file you want to transfer is ASCII, go on to the next step. If the file want to transfer is an executable, type the command `bin`. This sets ftp to retrieve files in binary format.



If you do not set ftp to retrieve in binary mode, any executable files you retrieve may not function properly.

8. To transfer files back to your system, type the command `get <filename>`. Issue this command for each file you wish to retrieve.



Once you are more familiar with this procedure, you may want to use the `mget` command. For example, instead of typing the `get` command twice, you could have also typed `mget <file1> <file2...>`. To transfer all files in the current directory, type `mget *`. For more information about ftp commands, simply type `help` at the ftp prompt.

9. Type `quit` to log out of ftp.

Moving files from a UNIX host to a Macintosh

If you have GatorShare, you can simply mount the GatorShare volume that holds the ftp files. If you do not, you can use Telnet to ftp the files from the host to your Macintosh.

1. Log into the host from your Macintosh using Telnet.
2. Choose **File->Set Transfer Directory** from the Telnet menu bar. This displays a Macintosh file window.
3. Select the Macintosh directory which will receive the files and click on **Set Directory**.
4. Choose **Network->Send FTP Command** from the Telnet menu bar. A command is issued from the host to the IP address of your Macintosh.
5. cd to the directory that holds the files you want to retrieve.
6. If the file you want to transfer is ascii, go on to the next step. If the file you want to transfer is an executable, type the command bin. This sets ftp to retrieve files in binary format.



If you do not set ftp to retrieve in binary mode, any executable files you retrieve may not function properly

7. Type the command `put <file name>` for each file.
8. Type `quit` when you are done to end the ftp session.

.sit and .hqx file name notations

Many file names contain the notations .sit and .hqx. These are naming conventions indicating files that are in stuffed (.sit) and/or binhexed (.hqx) format. These revised formats are used to compress the files so that they are more easily ftp'ed.

Files must be unstuffed and unbinhexed before they can be used. The program Stuffit®, a commercial archival utility, can be used both to unstuff and unbinhex files. You can obtain Stuffit® by contacting Aladdin Systems, Deer Park Center, Suite 23A-171, Aptos, CA 95003, (408) 685-9175.

Appendix B

Sample Boot Up Diagnostics Log

The following is a sample log from a successful bootup for a GatorBox that has all services configured, i.e., TCP/IP, AppleTalk Routing, GatorShare and GatorPrint. An explanation for each messages is provided.

6/27/91 2:15:59 PM L4 0 BR: GatorShare version 2.0 (build 1)6/27

This message shows you the software which is currently running along with the version number. BR refers to the boot service.

6/27/91 2:15:59 PM L4 0 BR: GatorBox10125

This line shows you the GatorBoxes name as it appears in GatorKeeper.

6/27/91 2:15:59 PM L4 0 BR: bootFlags: 0x0

Used by Cayman engineers.

6/27/91 2:15:59 PM L4 0 BR: starting kernel

GatorBox operating system starts up.

6/27/91 2:15:59 PM L3 0 LAP: LocalTalk node addr 0x80

GatorBox acquires an AppleTalk address on the LocalTalk side.

6/27/91 2:16:01 PM L4 0 ENET: thinwire (BNC) port selected

This was selected on the back of the box. Not applicable for Cabletron units.

6/27/91 2:16:01 PM L4 0 DR: DECNet router not enabled

This option was not configured in the GatorBox.

6/27/91 2:16:01 PM L4 0 IP: Adding interface ENET 0 at address 192.31.222.46 (default)

GatorBox's IP address set on the Ethernet interface.

6/27/91 2:16:01 PM L4 0 IP: Adding interface MAC-IP 0 at address 192.31.222.46 (range 192.31.222.47 to 192.31.222.48)

GatorBox's MacIP range initialized.

6/27/91 2:16:01 PM L4 0 IP: MacIP config

MacIP configuration begins.

6/27/91 2:16:01 PM L4 0 MacIP: name 0.0.0.0, file 0.0.0.0, other
0.0.0.0, 0.0.0.0, 0.0.0.0, 0.0.0.0

MacIP->More menu options set.

6/27/91 2:16:01 PM L4 0 MacIP: dynamic 1, static 0

One dynamic and zero static addresses have been defined.

6/27/91 2:16:01 PM L4 0 MacIP: NBP style ARP

Method by which the GatorBox queries Macintoshes running MacIP
applications to find out if they are still in use.

6/27/91 2:16:01 PM L3 0 IP: Adding default gateway at IP address
[192.31.222.12]

This adds the default gateway defined in the TCP/IP configuration menu.

6/27/91 2:16:01 PM L3 0 IP init completed

GatorBox IP code initialization completed.

6/27/91 2:16:01 PM L4 0 AR: AppleTalk router - Probing

AppleTalk Router begins probing for network information from other
routers on its LocalTalk and EtherTalk ports.

6/27/91 2:16:01 PM L3 0 AR: Configuring Ports

AppleTalk Routing configuration process begins.

6/27/91 2:16:01 PM L3 0 AR: Using Phase 2 config information

The routing configuration process uses the new GatorBox routing code.
Although the message states Phase 2, it does not mean that Phase 2 is in use.

6/27/91 2:16:01 PM L3 0 AR: Port 0 Phase 2 (LocalTalk), range 3030-3030, net 3030, flags 0x3

Port 0 is usually the LocalTalk port. This initial configuration uses the number which you assigned in GatorKeeper for the LocalTalk port.

6/27/91 2:16:01 PM L3 0 AR: Port 0 is a SOFT-SEED port

Port 0 in this case is the LocalTalk port. Soft-seed means that this GatorBox is configured with a specific LocalTalk net number, but will change the its net number if it hears from another device that the network number is different. The GatorBox will make t his change if it hears if it hears about the difference during boot up, before the AppleTalk router becomes fully functional.

6/27/91 2:16:01 PM L3 0 AR: Port 1 Phase 2 (802.2 AppleTalk 2.0), range 22200-22299, net 22200, flags 0x3803

Port 1 is usually the EtherTalk port. If you disable EtherTalk and use the GatorBox's tunneling feature, the tunnel itself will be considered Port 1. The same is true for the KIP/atalkad port. The configuration is taken from your entry in GatorKeeper. In this case, it is a Phase 2 range.

6/27/91 2:16:01 PM L3 0 AR: Port 1 is a NON-SEED port

Port 1 in this case is the EtherTalk port. Non-seed means that the GatorBox is configured with a specific network number for this port, and that it will *not* change its configuration even if it hears from another device that the net is a different number.

6/27/91 2:16:01 PM L3 0 AR: 802.2 port last used node id was (22200.112)

The GatorBox remembers its last used EtherTalk node address and tries to acquire the same address on bootup.

6/27/91 2:16:01 PM L3 0 AARP: initializing

The AppleTalk Address Resolution Protocol code begins. This is used to acquire the dynamic EtherTalk node address.

6/27/91 2:16:01 PM L3 0 AR: Port 2 Phase 2 (UDP/IP encapsulation), range 0-0, net 0, flags 0x402

In this case, an AppleTalk tunnel has been set up. This becomes a "virtual" port, i.e., although the physical port it will use is the ethernet port, the AppleTalk router considers this another port since the information it sends out the port is AppleTalk encapsulated in IP packets. The range is considered to be 0-0 since it is functioning more as a half-bridge.

6/27/91 2:16:01 PM L4 0 AR: adding seed route; net 0, type 0x2, flags 0x20a; bridge ip: 192.31.245.100 port 0

Here, the tunnel actually gets added to the initial routing table. Port 0 refers to the UDP port (see next messages) which has not yet been set.

6/27/91 2:16:02 PM L3 0 AR: UDP port 2 unit 1 initializing

Now, the UDP/IP portion of the tunnel is initialized.

6/27/91 2:16:02 PM L3 0 AR: UDP port 2 unit 1 socket base set to 910

The UDP port for the tunnel is set to 910. If you were using KIP you would see port 901.

6/27/91 2:16:05 PM L3 0 AR: 802.2 port set to node (22200.112)

The EtherTalk address is set to node 112 on network 22200.

6/27/91 2:16:05 PM L3 0 AR: rtmp distance cache enabled

The rtmp distance cache option has been enabled which allows faster processing of RTMPs. This option is particularly suited to extremely large AppleTalk network, i.e., a network with 100 or more AppleTalk routers.

6/27/91 2:16:05 PM L3 0 AR: ZIP NetInfoReply (from 22200.72), cable range 22200-22299, default zone Caribbean

Here, the GatorBox has heard from another router on the EtherTalk wire that the default zone for the EtherTalk Phase 2 network is Caribbean.

6/27/91 2:16:06 PM L3 0 AR: Saving config (node id) information
6/27/91 2:16:06 PM L3 0 AR: Saving port 0 node id (0.128)
6/27/91 2:16:06 PM L3 0 AR: Saving port 1 node id (22200.112)
6/27/91 2:16:06 PM L3 0 AR: Saving port 2 node id (0.0)
6/27/91 2:16:06 PM L3 0 AR: AppleTalk router up
6/27/91 2:16:25 PM L4 0 AR: AppleTalk Router Ports:
6/27/91 2:16:25 PM L4 0 AR: Port 0 Phase 2 (LAP), range 3030-3030,
net 3030, node 164, flags 0x3
6/27/91 2:16:25 PM L4 0 AR: Port 1 Phase 2 (8022), range 22200-22299,
net 22200, node 112, flags 0x3803
6/27/91 2:16:25 PM L4 0 AR: Port 2 Phase ? (IP), range 0-0, net 0,
node 0, flags 0xc02
6/27/91 2:16:25 PM L3 0 AR: Adding port 0 seed route, network 3030,
flags 0x0; bridge unset
6/27/91 2:16:25 PM L3 0 AR: Adding extended port 1 seed route,
network 22200-22299, flags 0x100; bridge unset

With this group of messages, the AppleTalk router saves all of its information that has been configured or that it has heard about so that it can come up as a router on the wire.

6/27/91 2:16:25 PM L3 0 DDP_Init completed.

Beginning with this message, the rest of the AppleTalk protocol stack is initialized.

This message refers to the Datagram Delivery Protocol.

6/27/91 2:16:25 PM L3 0 ATP_Init completed.

AppleTalk Transaction Protocol is initialized.

6/27/91 2:16:25 PM L3 0 NBP_Init completed.

The Name Binding Protocol is initialized.

6/27/91 2:16:25 PM L3 0 ASP_Init completed.

AppleTalk Session Protocol initialized.

6/27/91 2:16:25 PM L3 0 PAP_Init completed

Printer Access Protocol initialized.

6/27/91 2:16:25 PM L4 0 AFP: internal network 3030 (0xbd6), node 164 (0xa4)

AppleTalk Protocol Family is given its own port for GatorShare. This is a virtual port.

6/27/91 2:16:25 PM L4 0 AFP: Validating AFP/NFS Server Options

The AFP/NFS options are set starting with this message.

6/27/91 2:16:25 PM L3 0 AFP: srvrEntry: e533e, index: 0.

Used by Cayman engineers.

6/27/91 2:16:25 PM L3 0 AFP: server barbados; AFP name is barbados

Here the GatorBox checks the options you typed in GatorKeeper. The AFPname comes from the main screen once you select a server under the GatorShare Servers menu option.

6/27/91 2:16:25 PM L3 0 AFP: server barbados; IP address 192.31.222.11

The server's IP address is set.

6/27/91 2:16:25 PM L4 0 AFP:, server barbados; no volume list configured

No additional user-defined mount points have been set aside from the defaults i.e. Server's Export List and User's Home directory.

6/27/91 2:16:25 PM L4 0 AFP: AFP/NFS Validation finished

Indicates that the initialization of GatorShare servers is complete.

6/27/91 2:16:25 PM L3 0 AFP: Initialization completed

Indicates that the initialization of GatorShare services is complete.

6/27/91 2:16:25 PM L3 0 RIP: initializing

The Routing Information Protocol is initialized. This is used in the IP world for routing packets across networks.

6/27/91 2:16:25 PM L3 0 [Print Service] Received logical printer information for: oui.

The lpr printer name is set up.

6/27/91 2:16:25 PM L3 0 [Print Service] Received logical printer information for: oui-P.

This is the same printer but set up with different settings.

6/27/91 2:16:25 PM L3 0 AFP: Registering with NBP the AFP server: barbados

GatorShare now makes sure that the AppleTalk server name you set up for your NFS server is unique on your LocalTalk network. If another server has the same name, the registration attempt fails. The AppleTalk name is the name which will appear in the Chooser.

6/27/91 2:16:25 PM L3 0 RPC init completed

The Remote Procedure Call code, used by the NFS and Mount protocols is initialized.

6/27/91 2:16:25 PM L3 0 LOCK: initializing

Byte-Range Locking, which allows you to use multi-user databases on a GatorShare server, is initialized.

6/27/91 2:16:25 PM L3 0 LOCK: locks held locally

Don't try to access the same multi-user database through this GatorBox and another GatorBox since the byte-range locking function works on a per box basis only.

6/27/91 2:16:25 PM L3 0 SNMP: initializing

Simple Network Management Protocol code is initialized.

6/27/91 2:16:25 PM L3 0 SNMP: initializing DDP support

SNMP support for AppleTalk parameters on GatorBox is initialized.

6/27/91 2:16:25 PM L4 0 All services initialized, starting Scheduler

Now that all the services in the GatorBox are up, the Scheduler, which is responsible for inter-process communication in the GatorBox, starts up.

6/27/91 2:16:29 PM L3 0 AFP: NBP Register succeeded

The registration of the GatorShare server on the LocalTalk network has succeeded.

6/27/91 2:16:35 PM L3 0 AR: Network 50 acquired zone name
'Localtalk'

The AppleTalk Routing service in the GatorBox has now heard from another router about network 50 and so queries that router for the associated zone name. The message indicates that the reply was received from the remote router.

6/27/91 2:16:41 PM L3 0 IP: MacIP ARP init

The ethernet-to-IP Address Resolution Protocol is initialized.

6/27/91 2:16:46 PM L3 0 AR: Network 257 acquired zone name 'Real Work'

6/27/91 2:16:46 PM L3 0 AR: Network 8158 acquired zone name 'Combat'

6/27/91 2:16:46 PM L3 0 AR: Network 207 acquired zone name 'snozone'

6/27/91 2:16:56 PM L3 0 AR: Network 258 acquired zone name 'Engineering'

6/27/91 2:16:56 PM L3 0 AR: Network 259 acquired zone name 'Phone Zone'

6/27/91 2:17:06 PM L3 0 AR: Network 805 acquired zone name 'Postal'

6/27/91 2:17:06 PM L3 0 AR: Network 666 acquired zone name 'QANia'

6/27/91 2:17:17 PM L3 0 AR: Network 829 acquired zone name 'Gumby Land'

Beginning with these messages, the GatorBox is receiving network and zone information. It may take a few moments for all the zone names in your network to appear in the Chooser. These messages will continue to appear in the Diagnostics as new networks are added or their entries are refreshed.

Appendix C

Diagnostics Error Messages

The following are error messages that may appear in the GatorBox diagnostics. Messages are arranged alphabetically. Included is a brief explanation and guidelines for resolving the problem.

AFP: user's password didn't match password in YP

Indicates that the user name was in the YP map but that the passwords didn't match. This is different from the message, "YP: Lookup of <username> in Password Map failed" message which indicates that the username did not exist in the yppasswd database map.

AppleTalk net number cannot be in the start up range

The Phase II network numbers 65280 through 65534 are reserved for use by Macintoshes coming up on an ethernet where no router exists. Therefore, these network numbers cannot be configured on a GatorBox.

Authentication using files failed

- ▶ The GatorBox cannot find the /etc/passwd and /etc/group files.
- ▶ The timeout value may not be high enough. Change this under **Low Level Options** under **GatorShare Servers**
- ▶ You may be using the wrong server address for a server with multiple IP addresses. If you're running NIS (Yellow Pages), do ypmatch <servername> hosts. If not, do fgrep <servername> /etc/hosts. Check the returned IP address against the one entered in GatorKeeper.
- ▶ Some UNIX systems are now supporting "shadow" password files as an extra measure of protection. Basically the user names and id's are still kept in /etc/passwd but the actual password is kept in another more restricted file. The solution is to copy the encrypted password back into /etc/passwd.

Bad packet result code received

- ▶ This message should not be considered a problem unless you get a very large number of them. If this is the case then consider zeroing the NVRAM.

Desktop read loop

- ▶ This problem is sometimes seen in conjunction with the Gatorbox rebooting after opening a directory. Remove the .DESKTOP file and remount the volume.

Desktop volume is read only

- ▶ Make sure that the exported volume does not have a restriction which prevents the GatorBox from using it.
- ▶ You may have specified a path to the .DESKTOP file where you don't have write access.

Domain name not supported

- ▶ The GatorBox is probably using the wrong domain name. Type domainname on the UNIX machine to verify what the actual name is.

Ethernet loopback failed.

- ▶ Indicates a hardware problem. Call Cayman Technical Support.

ICMP destination unreachable; port unreachable

- ▶ This message may be produced by an incorrect broadcast address. On the server, type netstat -i to find out the ethernet interface name, then type ifconfig <interface name> (usually le0 or ie0). The output should

show the correct broadcast address for the network. Check to make sure that this number matches the broadcast address that you have specified in GatorKeeper.

- ▶ Check to make sure that the broadcast address is not the same as the GatorBox address.
- ▶ Another machine on the net doesn't approve of the broadcast and is sending back a reply which prompts this message.
- ▶ Another possibility is that Access Volumes isn't checked for the default mount points and there are no other mount points. Restart the GatorBox with Access Volumes enabled.
- ▶ This will occur if there is no UDP time service on the NFS Server.

Invalid server for files authentication (ESNFS_Login)

The server name for the path to the passwd or group file is incorrect.

- ▶ Delete the server from the Servers window, click done, open the Servers Window, redefine it and reenter the User/Group info.
- ▶ The last byte of the server's address is 0.

Lookup of <username> failed with error; No such key in map

The user's name is not in YP database. This can occur even when the user can log into the machine directly because in that case they could be using files authentication and not YP. (See also: YP_Lookup...)

MIP_ARP resolve no route to IP nnn.nnn.nnn.nnn

Generally seen if there is a break on the network or possibly a routing conflict. The message indicates that the GatorBox can't send an

encapsulated TCP/IP packet to a Macintosh because the Macintosh is not replying to ARP requests.

You may have closed a telnet session without actually logging out.

Mount of /<dirname> failed with error 2

The directory that you are trying to mount does not exist. The error 2 is being returned by the NFS server to the GatorBox. Make sure you don't have an extra space in the mount point name in GatorKeeper. The same holds true when specifying the path to the /etc/passwd and /etc/group files - make sure there are no spaces in the path names.

The timeout value in low-level options in GatorKeeper may need to be increased.

Check the mount points screen in GatorKeeper to make sure that there are no duplicate entries.

Mount of /<dirname> failed with error 13 - ownership violation

Indicates a problem with authentication. See Chapter 5, "GatorShare" for more information.

On Ultrix machines, make sure that mountd is not invoked with the -i option. This will prevent the GatorBox from mounting any directories.

Mount of /<dirname> failed with error 71

Error 71 in UNIX means: 71 EREMOTE Too many levels of remote in path. An attempt was made to remotely mount a file system into a path that already had a remotely mounted component.

Mount of /<dirname> failed with error 96

A/UX: You are trying to mount a pathname which is a symbolic link.

Network <####> going suspect

This is a normal message. Entries in the routing table must be refreshed periodically. If the GatorBox has not heard about this network within a specific period of time, it marks that network "suspect." If it has not heard about this network after another period of time, the network goes "bad" and is removed from the routing table. Setting your logging level to High in the diagnostics will prevent these messages from being logged.

This message is no longer logged with GatorBox software version 2.0 or later. The error message "Network <####> going bad" is logged at medium; "Network <####> being deleted" is logged at low.

NFS Write RPC Failed (d10c)

This message occurred in one instance where the NFS server (in this case a Sun 2) did not support a Read/Write size of 4624 bytes. Under low level options in GatorKeeper, reduce the R/W size to 1024 bytes.

The write operation may be timing out. Try setting the timeout options to 5000 milli-seconds under Low Level Options.

No port from portmapper

After adding the GatorBox to the hosts file, the YP database may not have been remade. When an RPC packet comes into the host, it includes the name of the client in ASCII - e.g., GatorBox00010. This name is checked by Hostsbyname and if YP is running it will check the YP hosts table, NOT the local hosts file.

No Route! from <aa.bb.cc> to <xx.yy.zz>

This message indicates that the GatorBox has picked up an AppleTalk routing packet destined for a net that it is the gateway to, net xx. The address <aa.bb.cc> is the net.node.port of the packet source; the <xx.yy.zz> is the net.node.port of the destination.

No Server List

Make sure you clicked **OK** in the *User/Group* info screen under GatorKeeper.

Open vol call failed

Indicates a problem with the `/etc/hosts` file or a timeout. See Chapter 5, “GatorShare” for more information.

Port 0 conflicts with existing bridge.

Indicates a LocalTalk network numbering conflict. See the relevant troubleshooting notes in Chapter 4, “AppleTalk Routing.”

Port 1: Network number overwritten; new network <##>

Indicates an EtherTalk network numbering conflict. Refer to the relevant troubleshooting notes in Chapter 4, “AppleTalk Routing.”

[Print Service] <name>.<type><zone> not found during network lookup.

This message indicates that either the *Printer LPR name*, the *Printer Type*, or the *Printer Zone* specified in *GatorPrint Printers* was incorrect. For more information, see Chapter 6, “GatorPrint.”

[Print Service] Received print request for unknown printer: <lpr name> from host <###.###.###.###>

Indicates that the lpr name on the Unix host does not match the *Printer LPR Name* specified in *GatorPrint Printers*. See Chapter 6, “GatorPrint” for more information.

(replace) network <####>, distance <#>, next

(replace) network <####>, distance <#>, next Router atalk: (##.##.##)

A normal message indicating that the entry for a specific network has been refreshed. Normal behavior has the network being added, then going suspect, then being replaced.

RPC: Lower level problem

May be a problem with the /etc/hosts file on the server you are trying to reach. See Chapter 5, "GatorShare" for more information.

RPC: Portmapper failed for host <###.###.###.###>; program 100003

Indicates that the GatorBox could not connect to the nfs process running on the GatorShare server. See Chapter 5, "GatorShare" for more information.

RPC: Portmapper failed for host <###.###.###.###>; program 100005

Indicates that GatorShare has not been able to authenticate using files because the mountd process was not running. See Chapter 5, "GatorShare" for more information.

RPC: port mapper NOPORT for host <###.###.###.###>; program 150001

Program 150001 refers to pcnfs style of authentication. You will see this message if you have selected pcnfs for authentication and the pcnfsd process is not running on your NFS server.

Stale file handle

This is usually a sign of the A/UX 1.1 bug where you can't export more than one file system. Upgrade to A/UX 2.0 or 2.1.

Timeout waiting for AARP response

An Ethertalk device is not responding to the GatorBox (possibly AlisaShare). EtherTalk devices resolve AppleTalk addresses into ethernet hardware addresses through the use of the AppleTalk Address Resolution Protocol (AARP). In the case of this message, the GatorBox has asked an EtherTalk node to return its ethernet hardware address and that node is not answering.

Unable to get server's time via udp time service

The GatorBox tries to get the date and time by talking to the time daemon on the UNIX host. If there is no time daemon, it will try to create a .DESKTOP file on the first file system in the exports list, read its time and date, and then delete the .DESKTOP file. If the user does not have write permissions on the first file system, then the GatorBox will not be able to set the proper date on any files that it creates.

Unknown authentication type 0

Simple fix: go to the User/Group info screen and select the authentication type you intend to use.

Unknown tag in NetCon configuration info

This message appears when the GatorBox has failed to download its image file, i.e., the GatorShare, GatorSystem or GatorPrint file. This will occur if there is a problem with the network, but also if GatorKeeper was not running when the GatorBox first restarted.

User's password didn't match password in file

This may indicate the use of shadow password files. The only solution if your system uses shadow passwords is to use PCNFSD for authentication.

YP: Lookup of <username> in Password Map of Domain Failed with Error-No such Key in Map

Look under Common Symptoms and Solutions in the GatorShare troubleshooting section.

YP: No YP server responded for user <username> in domain <domainname>

Indicates that the GatorBox was unable to authenticate because it received no response from the YP server. See Chapter 5, "GatorShare" for more information.

Appendix D

Diagnostics Error Codes

GatorBox diagnostic messages are sometimes preceded by error codes which may further illuminate the cause of the problem. Following is a list of some common error codes with the GatorBox code definition in capital letters and a brief explanation of that code.

Code	Definition	Explanation
ca0c	EDE_BADHW	Hardware is possibly defective
ca08	EDE_BADSOCKET	Error transmitting packet, bad socket descriptor
ca14	EDE_LOCKUP	Driver hardware was locked up
cb08	LDE_COLLISIONS	Excess collisions
c194	TPE-NORELERR	No release received for response
c18b	TPE_BADMESSAGE	Bad parameter in message
c400	KSE_BADBUFFER	User return an invalid buffer
d0d1	FPE_NFACCESS	NFS access violation. Usually caused by incorrect or missing GatorBox entry in the /etc/hosts file. If you are running YP, make sure the YP hosts database has been remade.
d0d2	FPE_NFMISC	Miscellaneous error. Look for other error messages.
d00d	FPE_MEMFREE	The GatorBox couldn't free up enough memory to perform the requested operation.
d07f	FPE_ACCESSDENIED	User does not have rights associated with the particular file or directory operation used.
d08c	FPE_NOTFOUND	Something wasn't found (e.g., a file or directory).
d031	FPE_BADSESSNUM	Bad AppleTalk session reference number. Usually caused by a previous AFP error. This message is more of a status indicator than an error message.
d060	FPE_PARAMERR	AppleTalk session reference number is unknown or a parameter error associated with the particular AFP operation was invalid. Some common parameter errors are that the volume identifier or pathname type is unknown or that the pathname is bad. Generally, this error code is not that useful. Please check the accompanying error message description in the diagnostic log for more information.
d062	FPE_BADVOL	If the volume identifier which the GatorBox has received from the AppleShare client is invalid (specifies a volume about which the Gatorbox does not know) this error is returned.
d10c	RPCE_TIMEOUT	Indicates a timeout. Try setting the Low Level timeout option to a higher value (e.g., 5000 milli-seconds).

Code	Definition	Explanation
d10d	RPCE_CANTDECODERESULT	An RPC reply may have corrupted information from the NFS server.
d109	RPCE_PORTMAP_NOPORT	Portmapper did not return a port for the requested operation. See more under the Error Messages section.
e002	ARE_DROPPEDPACKET	Dropped packet on purpose
e00c	ARE_BADPACKET	Packet with bad result code received
e60c	BSE_TFTPSVRTIMEOUT	TFTP server timed out
e016	ARE_BADPORT	Bad port, can't send packet, sending through unconfigured port
e018	ARE_BADRTMPPACKET	Invalid RTMP packet received, dropped
e019	ARE_AARPTIMEOUT	Timeout waiting for ARP response

Appendix E

ALAP Statistics

-- RECEIVE STATISTICS --

-- TRANSMIT STATISTICS --

Following is an explanation of the ALAP statistics that are displayed when you telnet to the GatorBox and issue the "show alap" command.

-- RECEIVE STATISTICS --

IntCount

Receive interrupt count.

This is a count of the number of times the scc asserted the interrupt line.

RcvCount

Good data packets received

This is the number of correctly formed LAP packets received.

CRCCount

Bad CRC (all packets)

This is the number of packets received with a bad CRC (cyclic redundancy check - it is similar to a checksum. There are 2 CRC bytes sent at the end of packet. The receiving end recalculates the CRC and compares the CRC value sent with the packet.

OvrCount

Receive overruns (all packets)

This is the number of packets received with an overrun error. An overrun occurs when the processor can not keep up with the inbound LAP byte stream. The SCC chip will buffer up to 3 bytes before requiring the processor to "read" a byte from the chip.

This can be caused by an unterminated localtalk.

LenErrCnt

Packet length does not match header's

This occurs when the two byte length following the ALAP header does not match the actual length of the packet received.

This can be caused by an unterminated localtalk.

BadCount

Bad packets seen.

This is the total number of "bad" packets received.

NoDtaCount

No packet seen after RTS in.

Number of times an RTS was received but no data followed.

RandomCTS

Unsolicited CTS.

Number of times a CTS was received when no RTS was sent.

NoBuffCount

Inbound packet but no msg buffers free

Number of packets received when no buffer was available to receive the packet.

-- TRANSMIT STATISTICS --

XmitCount

Data packets transmitted

This is the number of correctly formed LAP packets sent.

UndCount

Transmit underruns (all packets)

This is the number of packets transmitted with an underrun error. An underrun occurs when the processor can not keep up with an outbound LAP byte stream. The SCC chip will buffer up to 3 bytes before requiring the processor to "write" a byte from the chip.

CollsnCount

Number of assumed collisions

This is the total number of "collisions" packets received. A "collision" is defined as no CTS received or a line busy detected after a broadcast RTS.

DeferCount

Number of times deferred to other senders

The sending code will try for up to 400 microseconds to send a packet in the face of a "line busy" condition. After this time, it will "defer" and wait until an "end of packet" condition or a safety timer interrupt occurs.

IdleTOCount

Timed out waiting for end of packet

A safety timer is used to make sure "deferred" packets are sent. This counter is incremented every time the safety expires and a packet is still deferring.

BadDDP

Bad DDP packet.

Not currently used.

ExtIntCount

External interrupt count

Count of the number of "external" interrupts. These are programmed to occur at the "end of packet" condition when there are deferred packets to be sent.

AbortIntCount

Ext ints while deferring (abort) ints

Count of the number of "external" interrupts which occurred when an deferred packet was waiting. This is just a "qualified" count of the number of ExtIntCount counts.

EnableAbort

Enables of abort interrupt

Count of the number of times "external" interrupts have been enabled. This is done when a deferred packet is queued and waiting.

LineBusys

Found the line was busy

Count of the number of times a "line busy" condition is detected. After 400 microseconds of line busy, the packet is deferred.

TopOfDefer

Looked at top of defer queue

Number of times the top of the defer queue has been checked.

Appendix F

UNIX Commands

Following is a summary of useful UNIX commands. Each description includes the directory in which the command is usually located in case your PATH variable is not set up correctly. These commands are arranged alphabetically by name.

Note: If your Unix system has man pages installed, you can get more information about many of these commands by using the command `man <command name>`. Not all UNIX systems support all of these commands.

arp [-a] [-d <IP address>]

Displays the contents of the ARP cache. The -a options shows all entries in the arp cache. The -d <IP address> option is used to delete an entry from the arp cache.

atconfig <net.node>

Used to configure the AppleTalk number on a Sun running TOPS, where net is the AppleTalk network number and node is the node id of the Sun.

df

Disk free. Used to display the currently mounted file system and the available disk space on those file systems. If you can't access a directory after you are mounted, then do a df and see if that directory is actually a separate file system that is not in your exports list. Path=/usr/bin.

domainname

Displays the NIS (Yellow Pages) domain name in which the current machine resides.

exportfs [-a] [path]

exportfs [-a] [path]

The exportfs command used without the -a options displays the file system currently exported and any restrictions that apply. The -a options exports all of the file systems in the /etc/exports file. Used with the path option, it exports a single file system specified by path. Note that Sun OS 3.5 (as well as many other operating systems) do not have this command as they update /etc/exports automatically. Path=/usr/etc

hostname

Returns the name of the current host machine.

id

Shows your user id and group id as well as the groups to which you belong.

last

Shows list of logins. Path=/usr/uch

lastcomm

Lists commands recently executed and who executed them. Path=/usr/uch

ifconfig <interface> [-broadcast <broadcast address>]

Used with the <interface> option, displays the broadcast address and subnet mask of the interface specified. You can determine the interface name by

typing **netstat -i**. Used with the **-broadcast** option, sets the broadcast address for a specific interface. Path=/etc

Broadcast addresses will almost always be a fully qualified network address followed by either all 0s or all 255s for node numbers. For example:

Class A 10.0.0.0

Class B 128.10.0.0

Class C 192.11.12.0

lpc

Line printer control. Used to view the status of the print queues, enable queues and restart print daemons. Once you are at the **lpc>** prompt, type **help** to learn the commands you can use in **lpc**.

lpq -P<printer name>

Used to view the print queue for the printer specified by **<printer name>**.

lpr -P<printer name> <file>

Used to print a file specified by **<file>** to the printer specified by **<printer name>**.

man <command name>

Used to learn the syntax and options of a command specified by **<command name>**. Note that not all machines have the man pages installed.

more /etc/inetd.conf

This file displays the processes that are started upon request by the **inetd** daemon. If certain processes like **tftp**, **mountd** and **nfsd** are not explicitly running, they may be configured to run only when requested by the **inetd** daemon.

more /etc/resolv.conf

more /etc/resolv.conf

This file can tell you the name of the host providing name resolution services to the current machine.

netstat -[ir]

Used with the -i option, displays a list of network interfaces. The network interface reference is used in conjunction with the `ifconfig` command to determine the broadcast address and subnet mask of a host.

Used with the -r command, displays the current routing table. Path=/usr/uch

ps [-ax]

Executing this command with the -ax option lists all of the processes currently running on the system. Path=/usr/etc

ps [-ef]

The equivalent System V command to `ps [-ax]`. Lists all the processes current running on the system. Path=/usr/etc.

rpcinfo -p [-u]

Displays the processes currently registered with the portmapper, for example, the `nfsd` and `mountd` processes. To determine if the processes are actually running, use `ps -ax`. Note that 100003 is NFS, and 100004 is YP. The -u option issues NULLPROC. Path=/usr/etc.

rcp.mountd -n

Disables privileged ports. Path=/usr/etc

showmount -e <hostname>

Shows all hosts that currently have file systems mounted. Path=/usr/etc

trace <command>

Used on a Sun, displays the actual system calls used to process the command. Can be used to determine where certain naming information is coming from, for example, trace ping GatorBox1234 would trace the response and indicate whether the information came from the /etc/hosts file, the yellow pages server, or a domain name server. Other systems may not support the trace command.

ypcat <file>

Display the contents of the yellow pages file specified by <file>. For example, ypcat hosts displays the contents of the yellow pages hosts file.

ypmatch <text string> <file>

Used to verify that the <text string> is in the <file>. For example, ypmatch john passwd is used to verify that the user john appears in the passwd file used by for YP GatorShare authentication.

ypwhich

Displays the yp host serving the current machine.

Appendix G

Installing CAP on a UNIX Workstation

Unpacking the CAP files

Compiling the CAP Program

Modifying the Configuration Files

Testing the Configuration

Troubleshooting

Setting up lwsrv

Using lwpr

CAP is a set of Appletalk daemons that run on a UNIX machine. Its two major functions are file sharing and printer sharing. Printing can be set up to print from the UNIX machine to a LaserWriter on the Localtalk or from a Macintosh to a Postscript printer on the UNIX machine.

This appendix contains step by step instructions for installing printing capabilities with CAP version 5.0. Please note that these instructions have only been tested on a Sun 3/60 and a Sun 386i both running Sun OS 4.0, although CAP has been successfully installed on almost every UNIX machine.

NOTE: *Since these notes were first written, the rights to CAP have been purchased and CAP is therefore no longer available by anonymous ftp.*

Unpacking the CAP files

1. `cd` to the directory where you want to install the CAP code. This directory is usually `/usr/local`. Make sure you have at least 3Mb of free space (the code is 1.5M, but it is packaged in such a fashion that you need twice that amount during the beginning of the install). You can find out where you have enough space by using the `df` command.
2. Insert the tape and untar the cap archive:

```
% tar xvf
```

or

```
% tar xvf /dev/<your-tape-device-here>
```

This will extract a file called `cap50.tar`.

3. Unpack the CAP files:

```
% tar xvf cap50.tar
```

This will create a directory called `cap50` and unpack all the cap files underneath it. Do *not* remove the `.tar` file as you may need it later.

Compiling the CAP Program

1. `cd cap50`
2. Execute the Configure program by typing `Configure` (note capital 'C'). You will be asked a series of questions which for a Sun 3/60 or 386i running Sun OS 4.0 you can just press return. Afterwards, you may want to check the NOTES file for system specific notes.
3. Type:

```
cp m4.setup m4.setup.orig
```

This saves the setup file so that if you make a mistake later, you still have the original from which you can begin again. The file `m4.setup` controls where everything comes from and gets installed. It is necessary to edit this file to match the way things are done at your site. These instructions describe a procedure to install everything in a sub-directory of the `cap50` directory just made.

4. Using the editor of your choice, uncomment line 65 which begins `"define([debug]...)"` by deleting the leading `'#'`.
5. Uncomment line 111 and change the file `...pstextloc` to point to your postscript filter. This is a program that converts ASCII text files to postscript files. If you are only printing files that are already in postscript, do not uncomment this file. At Cayman we use `/usr/local/ps_filter` which is a program that one of our engineers wrote and is available for distribution.
6. ***Sun 386i (and other non-68000 based machines, except Sun 4's) ONLY!***

Add the following lines to `../cap50/netat/abnbp.h` and `../cap50/lib/afp/afpcmd.c`:

```
# ifndef BYTESWAPPED
# ifdef sun386
# define BYTESWAPPED
# endif
# endif
```

Note that you should replace sun386 with your machine type.

7. Make a directory for the binaries:

```
% mkdir ../cap50/bin
```

8. Create the make files:

```
% gen.makes
```

9. Create the libraries:

```
% make libsmade
```

10. Compile the programs:

```
% make programs
```

11. Install them in the bin directory which you made above:

```
% make install
```

Modifying the Configuration Files

1. In the cap50/etc directory create the files cap.printers and atalk.local. These files have the following format:

```
cap.printers:
```

```
#UNIXPrinterName=ApplePrinterName:LaserWriter@PinterZone
```

```
testprinter=Window Pane:LaserWriter@Real Work
```

!Do not put any spaces in front of the printer name (testprinter, in this case). CAP takes everything to the left of the equal sign to be the printer name on the unix side.

```
atalk.local:
```

```
# mynet mynode myzone
```

```
31.222 11 kipzone
```

```
#bridgenet bridgenode bridgeIP
```

```
31.222 104 192.31.222.104
```

The explanation of each of these is as follows:

Field	Example	Description
Mynet	31.222	This number is arbitrary as long as it is the same as the KIP Appletalk network number.
Mynode	11	The last number of CAP server's IP address
Zone	kipzone	The KIP Zonename
Bridgenet	31.222	The same as Mynet
Bridgenode	104	The last byte of the GatorBox IP address
BridgeIP	192.31.222.104	Full GatorBox IP address

Make sure that there is a carriage return at the end of the last line in both files.

In this example the code is being installed on a Sun 3/60 with IP address 192.31.222.11 using a GatorBox with IP address 192.31.222.104.

2. Edit `/etc/printcap` to contain an entry for the new printer. For this example it would be something like this:

```
/etc/printcap:

#entries already there

testprinter|Test Printer:\

:lp=/dev/null:\

if=/usr/local/cap50/bin/testprinter
```

Again, make sure that there is a carriage return at the end of the last line.

3. `cd ../cap50/bin` and type:

```
% ln -s papif testprinter
```

4. Edit `/etc/services` to comment out the `at-*` services.

If you are using NIS (Yellow Pages) make sure that you remake the services database by:

```
% cd /etc/yp (or /var/yp on Sun OS 4.0.x)

% make services
```

Do this as the user root!

Configuring the GatorBox

1. Configure AppleTalk Routing on your GatorBox. It is important that the information in the `atalk.local` file corresponds with the information that you enter in GatorKeeper. Note that the GatorBox needs to have both the KIP options and Appletalk Routing turned on.

AppleTalk Routing

LocalTalk number	1
LocalTalk name	LocalTalk
EtherTalk number	2
EtherTalk name	EtherTalk

KIP Options

KIP Appletalk network number	8158
KIP Appletalk node number	104
KIP Appletalk network name	kipzone
KIP network number	192.31.222.0

KIP Appletalk network number

The KIP AppleTalk Network Number is the same number which you used in `atalk.local` for bridgenet only the format is different. In this case we used 31.222 which translate to 8158 in GatorKeeper ($31 * 256 + 222 = 8158$). Note that this number should be different from both the LocalTalk and Ethertalk network numbers.

KIP Appletalk node number

The KIP AppleTalk Node Number is equal to the bridgenode number which is the last byte of the GatorBox IP address.

KIP Appletalk network name

This is just the name of your KIP zone and corresponds to Zone.

KIP network number

The KIP IP Network Number is the bridgeIP with the last byte set to 0.

Remember to use the numbers relevant to *your* site and not the ones provided here.

2. Save these changes and reboot your GatorBox.

Testing the Configuration

1. `cd ../cap50/bin`. We will now test that everything works.

```
% getzones
```

This should print out a list of the zones that are on your network as shown below:

```
abInit: [ddp: 31.222, 1] starting
Count is 3
ZONE kipzone*
ZONE EtherTalk
ZONE LocalTalk
% atlooklws "=:LaserWriter@LocalTalk"
```

This should print out information about your laser writer. Example output:

```
abInit: [ddp: 31.222, 1] starting
Looking for =:LaserWriter@LocalTalk ...
01 - Window Pane:LaserWriter@* [Net: 1.01 Node:150 Skt:202]
---job: art; document: demo final; status: waiting; source:
AppleTalk
Address confirmed for socket 202
```

2. Now you can start up your new printer. As root:

```
% lpc
lpc> down testprinter
lpc> up testprinter
lpc> status
      <status info printed out here>
lpc> quit
%
```

3. Test it (not necessarily as root)

```
% lpr -Ptestprinter file
% lpq -Ptestprinter
or
% setenv PRINTER testprinter
% lpr file
% lpq
```

TroubleShooting

1. If atlook doesn't work correctly.

- ▷ Double check to make sure that the KIP options and atalk.local are setup correctly and that you are using the correct zone name.
- ▷ Make sure that you are typing atlook =:@appletalkzone (where appletalkzone is the LocalTalk zone name not the KIP zone).

Also, CAP5 will attempt to use a port range of 206 - 2xx for its appletalk services on the UNIX host. However, the GatorBox does *not* support this range and will use the old range of 768-770. This port information is stored in the /etc/services file. If the 206 - 208 range is defined in /etc/services, comment it out. CAP will default back to the 768-770 range. If you are using YP, be sure to remake the services database by typing `make services`.

- ▷ Make sure that the broadcast address is correct.

When you search for a LaserWriter in the Chooser, an NBP lookup goes out onto the AppleTalk net looking for device "laserwriter" in selected zone. When it reaches the GatorBox, aBBnd routing is turned ON, the KIP options are on, and the GatorBox takes that NBPlookup packet and encapsulates it in a UDP packet. This UDP packet is *not* sent directly to the CAP server but instead is sent out as a broadcast packet. This means that the broadcast address **MUST** be correct for that net and it must agree with the broadcast address of the server on which CAP is running. Therefore, use the standard `netstat - i` and `ifconfig` commands to check whether the broadcast address is correct.

2. If `getzones` doesn't work correctly:

- ▷ KIP appletalk net number doesn't match `mynet` and `bridgenet` number in `atalk.local`
- ▷ The `/etc/services` file may have the UDP 200 port range defined. Take this out. If you are using YP make sure to remake the services database with `make services`.
- ▷ They have not specified their machine as a byte-swapped machine (this is only relevant for non-68000-based machines like the 386i).

```
# ifndef BYTESWAPPED
# ifdef sun386
# define BYTESWAPPED
# endif
# endif
```

3. Recheck your physical connections.

- 4. If you are trying to get `iwpr` (print file to AT imagewriter) running through a GatorBox, you may have to set `SBUFMAX` (defined around line 55) to be "512" rather than `8*SFLOWQ (=4096)`.
- 5. If `getzones` and `atlook` work correctly but you still don't get anything to print:

- ▷ Try piping your text file directly to the postscript filter, for example, `cat textfile | ps-filter | lpr -Pprintername`. If it works,

then you probably configured `m4.setup` wrong and need to recompile CAP.

- ▷ Make sure that there are no spaces at the beginning of the line in the `cap.printers` file. CAP takes everything to the left of the equal sign to be the name of the printer.
- ▷ Earlier versions of the LaserWriter Namer program appended a space to the end of the name of the LaserWriter. Make sure that you either remove the space or reflect it in the `cap.printers` file.

6. Other notes:

- ▷ CAP includes a filter which encapsulates text files created on the UNIX side in postscript so that printing to the laserwriter from `lpr` works correctly.
- ▷ You might have a problem trying to print from GEMdraw to an Imagen laser printer. The problem is that GEM doesn't kick out postscript in a fashion which is acceptable to Imagen printers so you need to get a patch for GEMdraw from DRI (Digital Research Inc.).
- ▷ You **MUST** have a valid `lp=` field. `lpd` needs to point to something. However, since `lpd` also wants to 'lock' this entry, you need to specify a different entry for each printer. You could use something like `/dev/nulla`, `/dev/nullb`.
- ▷ If you get the following message when trying to get `atis` to work:

NIS: NIS socket not available error -1: Address already in use

Try to launch your cap services *before* all the other tcp/udp stuff. So your cap script should probably be the first thing entered in `/etc/rc.local`. Reboot the system and all should be well.

Setting up lwsrv

lwsrv is a spooling agent which either can be used to spool jobs from Macintoshes and send them back to a localtalk-based LaserWriter or, more commonly, make a UNIX-based printer look like a LaserWriter.

1. Create a shell script which starts up **atis** and **lwsrv**. It should look something like this:

```
#!/bin/sh
#Sample start servers file
#allow atis to startup first
/usr/local/cap/cap50/etc/atis
#wait a moment
sleep 5
#start lwsrv
/usr/local/cap/cap50/bin/lwsrv \
-p red-lw \
-n RedPrinter \
-a /usr/local/cap/cap50/bin/ADicts \
-f /usr/local/cap/cap50/applications/lwsrv/LWFonts \
-T crtolf \
-T MAKE_NONDSC_CONFORMANT
```

2. After installing CAP and compiling **atis** and **lwsrv**, there is one critical step which you must perform if you want to print to UNIX-based postscript printers. The reason for this is that **lwsrv** attempts to generate a file called a **procset** and fails to do so in the correct format. Here's how the authors of CAP describe a **procset**:

"The LaserPrep contains what Apple calls an **AppleDict**. The **AppleDict** is really known as a **ProcSet** under the Postscript document structrion conventions.

For newer versions of LaserPrep following version 2.0 of the Adobe PostScript document structuring conventions, unknown **ProcSets** are automatically captured (with the **ExitServer** code stripped).

The Procset is recorded into a file called FoundProcSet.<time>. The first line of the file is "%BeginProcSet: <tag>" where <tag> describes the particular procset. This line is critical since this is how lwsrv determines that this is a valid ProcSet.

Unfortunately, the LaserPrep's FoundProcSet files are not usable without some restructuring. Therefore, because CAP's procset is no good, you must create your own procset. Here's how to do it:

- a. If you're running Multifinder, turn background printing OFF. Just go to the Chooser, select LaserWriter, and turn off radio button for Background printing. Make sure, however, that you have selected LaserWriter (even if you don't have one on your LocalTalk network). If you select ImageWriter, this will not work.
 - b. Launch your favorite word processor or text editor. Create a new document. You don't have to type anything into it. Just choose **Print** from the **File** menu. Then, immediately after clicking on **OK**, press Command-K. This will create a Postscript file in the same directory that your word processor's in.
 - c. Copy the Postscript file (called Postscript0 or Postscript1) to your CAP server using either FTP in Telnet or GatorShare (in this case, make sure it's AppleDouble format).
 - d. Once the file is on the CAP server, you must run a utility called `preprefix` (created by `macps.shar`) on the data fork of the Postscript file you created. `Macps` is available from Cayman on floppy. It is a utility which takes a postscript file and extracts a valid procset from the file. This procset is then placed in the `ADicts` directory and is prepended to files being printed from the Macintosh to the UNIX-based postscript printer.
3. If, in setting up lwsrv or trying to get `atis` running you get the message: `NISSocket not available, error 1 address already in use`, use then use `ps -ax` to see whether a bunch of `atis` processes are already running. If so, kill them and then try restarting `atis`.
 4. If you have problems finding `_fpa_handler`, then the problem may be with the compiler on the machine that compiled the `lwpr` program. The fix is to make sure that the variable `LWNAME` is initialized to `NULL` in `lwpr.c` and then to recompile.

Using lwpr

lwpr is located in the ../cap50/bin directory

lwpr allows you to send a single file to a LaserWriter. The syntax is `lwpr -p lwname <file>`. The LaserWriter name should be the fully qualified name (e.g., "LaserWriter:LaserWriter@*"). If you have your PRINTER environment variable set to a printer that maps to a LaserWriter (via `cap.printers`), then you may omit the "-p" option.

Appendix H

Decimal-Hexadecimal Conversion

Decimal values appear on the left within each column. Hexadecimal values appear on the right.

0	00	32	20	64	40	96	60	128	80	160	a0	192	c0	224	e0
1	01	33	21	65	41	97	61	129	81	161	a1	193	c1	225	e1
2	02	34	22	66	42	98	62	130	82	162	a2	194	c2	226	e2
3	03	35	23	67	43	99	63	131	83	163	a3	195	c3	227	e3
4	04	36	24	68	44	100	64	132	84	164	a4	196	c4	228	e4
5	05	37	25	69	45	101	65	133	85	165	a5	197	c5	229	e5
6	06	38	26	70	46	102	66	134	86	166	a6	198	c6	230	e6
7	07	39	27	71	47	103	67	135	87	167	a7	199	c7	231	e7
8	08	40	28	72	48	104	68	136	88	168	a8	200	c8	232	e8
9	09	41	29	73	49	105	69	137	89	169	a9	201	c9	233	e9
10	0a	42	2a	74	4a	106	6a	138	8a	170	aa	202	ca	234	ea
11	0b	43	2b	75	4b	107	6b	139	8b	171	ab	203	cb	235	eb
12	0c	44	2c	76	4c	108	6c	140	8c	172	ac	204	cc	236	ec
13	0d	45	2d	77	4d	109	6d	141	8d	173	ad	205	cd	237	ed
14	0e	46	2e	78	4e	110	6e	142	8e	174	ae	206	ce	238	ee
15	0f	47	2f	79	4f	111	6f	143	8f	175	af	207	cf	239	ef
16	10	48	30	80	50	112	70	144	90	176	b0	208	d0	240	f0
17	11	49	31	81	51	113	71	145	91	177	b1	209	d1	241	f1
18	12	50	32	82	52	114	72	146	92	178	b2	210	d2	242	f2
19	13	51	33	83	53	115	73	147	93	179	b3	211	d3	243	f3
20	14	52	34	84	54	116	74	148	94	180	b4	212	d4	244	f4
21	15	53	35	85	55	117	75	149	95	181	b5	213	d5	245	f5
22	16	54	36	86	56	118	76	150	96	182	b6	214	d6	246	f6
23	17	55	37	87	57	119	77	151	97	183	b7	215	d7	247	f7
24	18	56	38	88	58	120	78	152	98	184	b8	216	d8	248	f8
25	19	57	39	89	59	121	79	153	99	185	b9	217	d9	249	f9
26	1a	58	3a	90	5a	122	7a	154	9a	186	ba	218	da	250	fa
27	1b	59	3b	91	5b	123	7b	155	9b	187	bb	219	db	251	fb
28	1c	60	3c	92	5c	124	7c	156	9c	188	bc	220	dc	252	fc
29	1d	61	3d	93	5d	125	7d	157	9d	189	bd	221	dd	253	fd
30	1e	62	3e	94	5e	126	7e	158	9e	190	be	222	de	254	fe
31	1f	63	3f	95	5f	127	7f	159	9f	191	bf	223	df	255	ff

Appendix I

Glossary

AARP	Appletalk Address Resolution Protocol
ADSP	Appletalk Data Stream Protocol
AFP	Appletalk File Protocol
ALAP	Appletalk Link Access Protocol
ARP	Address Resolution Protocol
ASP	Appletalk Session Protocol
AT	Appletalk
ATP	Appletalk Transaction Protocol
GB	GatorBox
CAP	Columbia Appletalk Package for Unix
DDP	Datagram Delivery Protocol
EP	Echo Protocol
FTP	File Transfer Protocol
ICMP	Internet Control Message Protocol
IP	Internet Protocol
ISO	International Standards Organization
KIP	Kinetics Internet Protocol
LAP	Link Access Protocol
NBP	Name Binding Protocol
NFS	Network File Service
NIC	Network Information Center
OSI	Open Systems Interconnection
PAP	Printer Access Protocol
RARP	Reverse Address Resolution Protocol
RFC	Request for Comments (NIC)
RIP	Routing Information Protocol
RPC	Remote Procedure Call
RTMP	Routing Table Maintenance Protocol
SMTF	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
TCP	Transaction Control Protocol
UDP	User Datagram Protocol
YP	Yellow Pages
ZIP	Zone Information Protocol

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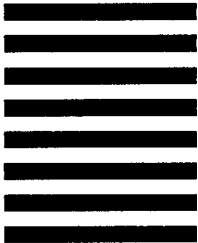




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